Paper

TRADE JOURNAL

WOOD PULP

G

Established 1886

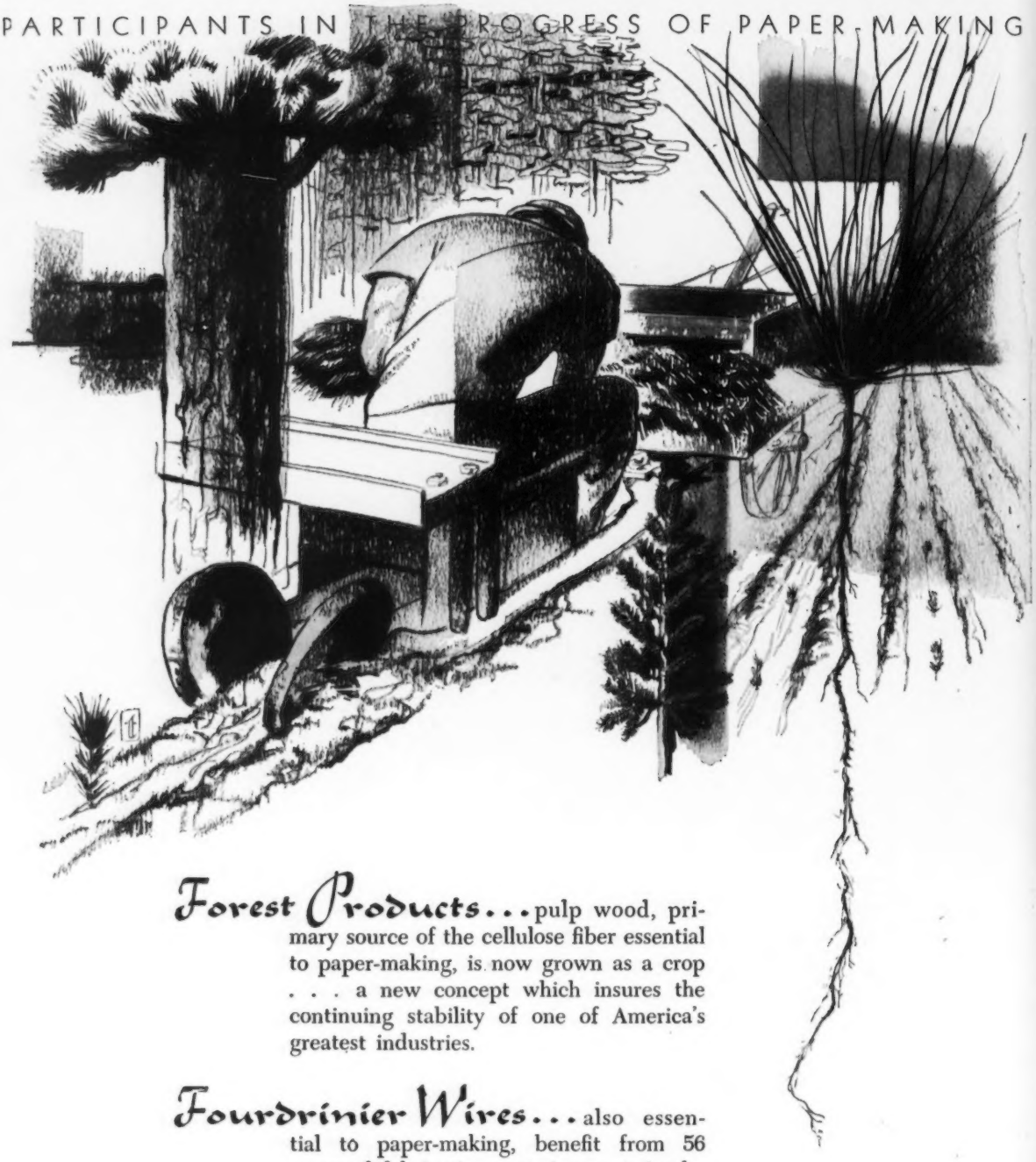
"Servant of fame . . . servant of business."
FRANCIS BACON

That might well be Pulp and Paper . . . For centuries, Paper has been the indispensable servant of mankind, the prime medium for the communication of the written word. In more recent decades, it has become a commercial necessity of the very first magnitude.

Daily—and in ever-increasing measure—the Pulp and Paper Industry serves well the peoples of the world.

GOTTESMAN & COMPANY
— INCORPORATED —
100 PARK AVENUE • NEW YORK 17, N. Y.
EUROPEAN OFFICES: Birger Jarlsgatan 8, Stockholm, Sweden

PARTICIPANTS IN THE PROGRESS OF PAPER-MAKING



Forest Products . . . pulp wood, primary source of the cellulose fiber essential to paper-making, is now grown as a crop . . . a new concept which insures the continuing stability of one of America's greatest industries.

Fourdrinier Wires . . . also essential to paper-making, benefit from 56 years of fabrication experience at Appleton Wire Works, Inc., where continuous research — directed toward making a better product — has *earned* the acknowledgment that *"Appleton Wires are Good Wires!"*

APPLETON WIRE WORKS, INCORPORATED • APPLETON, WISCONSIN

That's the record of a 3-machine Mexican Mill,* after installing the Jones equipment shown in the flow-chart above.

Three Jones High-Speed Refiners and one Standard Jordan replaced two 250-h.p. refiners and two 150-h.p. Jordans when this mill modernized the stock preparation for its largest paper machine — making about 20 t.p.d. of sulphite bonds and 12 to 14 t.p.d. of manifold papers.

The new installation has increased production by 10% while producing equal or better quality papers. Why don't *you* find out what the Jones High-Speed Refiner can do for your cost and quality controls? Ask your Jones representative or write direct for Bulletin EDJ-1011B.

**Name on request*

MR. C. H. VICKERY, Sales Manager of E. D. Jones & Sons Co., says:

"This example, typical of many in our files, helps explain the popularity of this versatile, highly economical refiner. More than 1000 of these 'mighty mites of stock preparation' have been sold (not including those made by imitators!) since it was introduced in 1935."

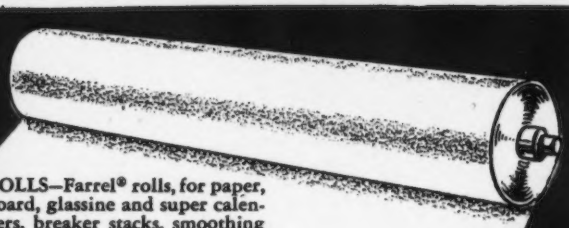
E.D. Jones

E. D. JONES & SONS COMPANY
Pittsfield, Massachusetts

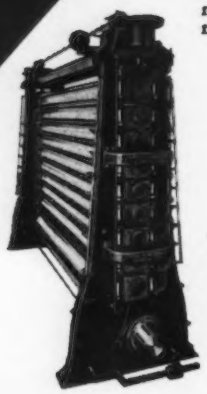
BUILDERS OF QUALITY STOCK PREPARATION MACHINERY

HERE ARE FOUR AIDS . . .

To Making Better Paper

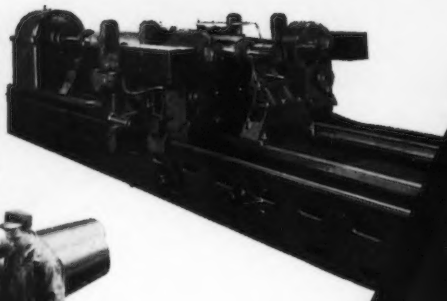


ROLLS—Farrel® rolls, for paper, board, glassine and super calenders, breaker stacks, smoothing presses, etc., are furnished in sizes from 5″ to 72″ in diameter and up to 312″ face length. These precise, long-lived rolls are made of various metals and metal alloys to suit different mill requirements. Bulletin No. 116.



CALENDERS — Farrel paper-machine calenders can be made with rolls in any face length up to 312″. Board calenders are also available in a wide range of sizes, designed to suit individual requirements. Bulletin No. 117.

ROLL GRINDERS—Farrel two-wheel roll grinders incorporate the exclusive swing-rest principle and are equipped with the Farrel patented crowning device. The most accurate mechanism yet devised for grinding long rolls, these machines are available in two sizes for handling rolls up to 32″ and 42″ diameters, any length required. Bulletin No. 118.



Almost a century of experience lies behind the design and manufacture of Farrel paper mill equipment. The company was one of the first to make chilled iron rolls in the United States and pioneered in making rolls for paper mills. Today, *the world's largest specialty roll shop* is located at the Farrel plant in Ansonia, Connecticut, which also has complete modern foundry facilities, and machine shops for producing these aids to making better paper.

ROLL CALIPERS — Farrel roll calipers provide the quickest and most accurate means of checking crown shape and variations in roll diameter, either when the roll is in or out of the grinder. They are made in five standard sizes for rolls from 4″ to 50″ in diameter. Bulletin No. 112-A.

Individual bulletins describing these four types of equipment will be sent to you on request. Just fill out the coupon and mail it today.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT
Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Akron, Chicago, Los Angeles, Houston

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

Please send me, without cost or obligation, copies of the bulletins checked below:

- ....Bulletin 116 "FARREL ROLLS FOR PAPER MILLS"
- ....Bulletin 117 "FARREL PAPER-MACHINE AND BOARD CALENDERS"
- ....Bulletin 118 "FARREL TWO-WHEEL, SWING-REST ROLL GRINDERS"
- ....Bulletin 112-A "FARREL INDICATING CALIPER"

Name_____

Company_____

Address_____ Country_____

City_____

Paper TRADE JOURNAL

VOL. 135—No. 12 SEPTEMBER 19, 1952

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ANNUAL MILL ISSUE

What's the pH?, is probably the most often asked question in the paper industry. Some times it seems as if the whole paper making business revolves around this term. It seems to be tied up with pulp quality, machine operation, sizing coloring, and even the printing results in some cases to say nothing of the permanance of high grades. There are several methods of determining pH and many instruments available. W. M. Wooding has made a comprehensive study of these instruments, which we feel is a valuable contribution to modern papermaking.

REMEMBER THESE DATES

SEPT. 25-27: Pacific Coast Div., of the American Pulp and Paper Mill Superintendents Assn., Joint Meeting with Pacific Coast Section of TAPPI, Pacific Coast Branch, Technical Section C.P.P.A., Empress Hotel, Victoria, B. C., Canada.

SEPT. 26-27: Pennsylvania-New Jersey-Delaware Div. of American Pulp and Paper Mill Superintendents Assn., Fall Meeting, Galen Hall Hotel, Wernersville, Berks County, Pa.

OCT. 8-10: The Southern and Southeastern Divisions of the American Pulp and Paper Mill Superintendents Assn., Joint Meeting, Hotel Roanoke, Roanoke, Va.

OCT. 11: Connecticut Valley Div. of American Pulp and Paper Mill Superintendents Assn., Fall Meeting, Berkshire Inn, Great Barrington, Mass.

OCT. 13-16: 7th Engineering Conference of the Pulp and Paper Industry, Morrison Hotel, Chicago, Ill.

OCT. 20-24: 40th National Safety Congress and Exposition at Conrad Hilton, Congress, Morrison and Sheraton Hotels.

OCT. 27-28: Ninth Fibrous Agricultural Residues Conference, Northern Regional Research Laboratory, Peoria, Ill.

OCT. 30 to NOV. 1: National Paper Trade Assn., Edgewater Beach Hotel, Chicago, Ill.

NOV. 5-6: TAPPI Plastics Conference, Marshall Hall, College of Forestry, State University of New York.

NOV. 12-14: Alkaline Pulping Conference, Technical Assn. of the Pulp and Paper Industry, Battle House, Mobile, Ala.

NOV. 20-21: TAPPI Corrugated Container Conference, Schroeder Hotel, Milwaukee, Wis.

SUBSCRIPTIONS

Payable in advance—Single Copy 15c-U. S. $5.00 per year—U. S. Possessions $7.00 per year.

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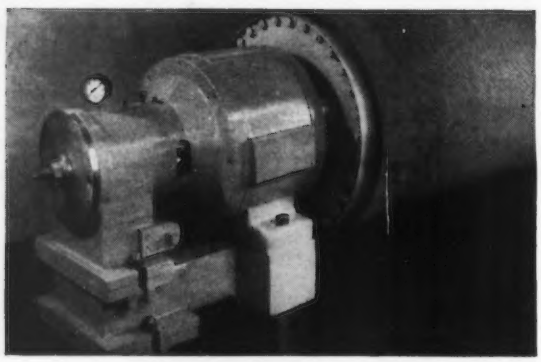
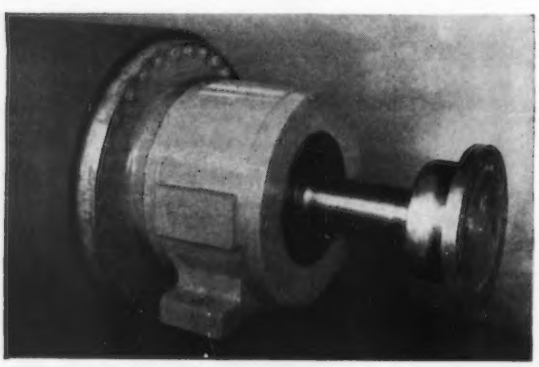
This new, improved Suction Press Roll steps up efficiency... profit!



Note these improvements: Stainless Steel end rings, stainless studs and nuts, generous size anti-friction bearings and housings, and positive locking strips for bonding rubber to centrifugally cast bronze shell.



Rugged steel forgings, fewer working parts and easily replaced packing are only a few of the features of the new Manchester rubber-covered drilled suction press roll.

MANCHESTER has designed this new Suction Press Roll that speeds up production, improves paper quality, gives you greater efficiency on the wet end, and increases your profits.

This rubber-covered drilled Suction Press Roll has every modern engineering advantage you need for top quality and full production. It will reduce your fuel costs in the dryer operation and more than repay the investment.

Write for our new illustrated catalog; and ask us to tell you more about the operating advantages of the Manchester Suction Press Roll.

A Few Other Manchester Products

Drum Winders • Adjustable Shake Motion • Pope Type Reels Paper Machine Drives • Size Presses • Rubber-Covered Drilled Suction Drum Rolls • Drilled Suction Couch Rolls • Cylinder Moulds Complete Fourdrinier • Roll Grinding

• • • • • • • • •

THE MANCHESTER MACHINE COMPANY

1708 CENTRAL AVENUE • MIDDLETOWN, OHIO

SPECIALISTS IN PAPER MILL MACHINERY AND COMPLETE REPAIR SERVICE

DO YOU WANT
MAXIMUM
CUTTING
ACCURACY?

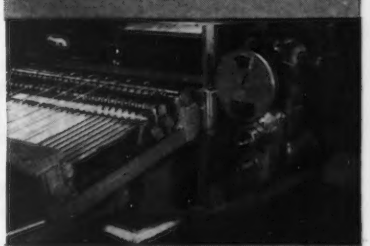
INVESTIGATE THE
NEW DOWNINGTOWN
MASSON-SCOTT SUPER CUTTER & LAYBOY

Accuracy in a high speed cutter is essential for the production of a quality sheet . . . to reduce rejections due to imperfect edges and sizes. The Downingtown Masson-Scott Super Cutter and Layboy is a highly accurate cutter which does not sacrifice speed to secure this accuracy. A tolerance of ±1/64th inch or better is maintained over long periods of sustained high speed cutting *without* the necessity for making frequent adjustments.

Specially designed slitting mechanism is a part of the Super Cutter and permits accurate sheet trim and slitting without any additional operations or labor. Another point of accuracy is found in the Layboy of the Downingtown Masson-Scott Super Cutter. Here sheets are piled from the floor upwards in uniform, straight sided stacks. Automatic counters and similar equipment can be supplied as desired.

Your Downingtown Sales Engineer will submit complete data about the Downingtown Masson-Scott Super Cutter and Layboy or write for Bulletin No. 252A.

View showing adjustment mechanism for different sheet lengths.



Indicator and mechanism for controlling length of sheet being cut.

MODERNIZATION IS CONSERVATION

DOWNINGTOWN MANUFACTURING COMPANY, DOWNINGTOWN, PA.

Pacific Coast Representative: John V. Roslund, Pacific Building, Portland 4, Oregon
Downingtown Fibrepulper, Manufactured in Canada by Waterous, Limited, Brantford, Ontario

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DESIGNERS AND BUILDERS OF PAPER, BOARD AND FELT MACHINES SINCE 1880

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Washable
WALLPAPERS
You can do so much more with wallpaper!
More style . . . more beauty . . . more years of service . . . in every price range

You saw this advertisement in House & Garden

IMPERIAL *Washable* WALLPAPERS ®

use Huber Clays

Imperial Washable Wallpapers are noted for their bright, true, long-lasting colors...their easy-to-clean surfaces. To maintain this high standard, Imperial knows that only quality raw materials can be used. That's why Huber is a major source of clays for Imperial Paper and Color Corporation.

Over 25 years of experience in clay production are behind Huber Clays...each designed to meet the exacting needs of modern printing requirements. Product uniformity is controlled by 13 vital laboratory tests*—from crude to finished clay—assuring uniform properties from one clay carload to the next.

If you want the maximum performance from your papers, try Huber Clays. Write today for your free working sample.

HUBER

ONE OF THE WORLD'S LARGEST CLAY PRODUCERS

MINES & PLANTS: LANGLEY, S. C., GRANITEVILLE, S. C., AND HUBER, GA.

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Quality Clays for the Paper Industry

HI-WHITE—low cost airfloated filler clay, mined in Georgia, of high brightness, fine particle size, minimum abrasion. Tested regularly each half-hour during production.

PARAGON—produced in South Carolina, this low cost airfloated filler has a slightly larger particle size than Hi-White, its Georgia counterpart. Refined to the same close specifications with respect to abrasion and uniformity.

WWF—a Georgia water-washed filler of high, dependable brightness. Available in lump form for use where this type is preferred over the fluffier airfloated fillers. Also available pulverized.

HYDRATEX—a Georgia coating grade of medium particle size distribution and priced accordingly. Quality controlled throughout. Lump or pulverized.

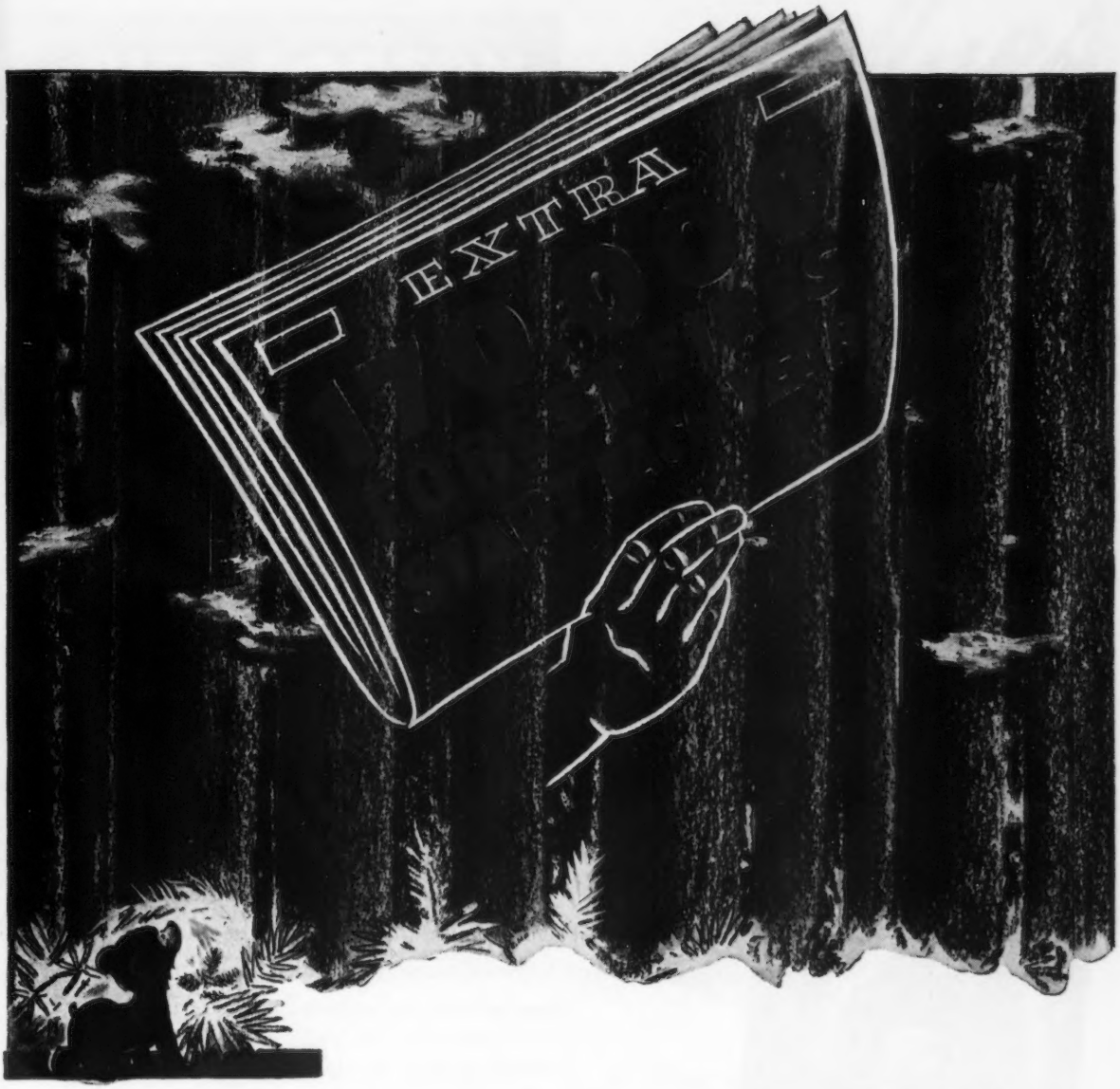
SPECIAL HYDRATEX—a Georgia coating grade of fine particle size, with excellent covering power and flow characteristics ideally suited to certain coating methods. Lump or pulverized.

X-43—a fine particle Georgia coating clay of low viscosity and high brightness particularly well adapted to high solids coating. Lump or pulverized.

X-44—a low viscosity Georgia coating grade containing a minimum of soluble salts; excellent for color pigmentation. Lump or pulverized.

HYDRASPERSE—a drum-dried low viscosity, high brightness, fine particle, Georgia coating grade, in flake form, with the dispersant already added. Saves "make down" time and assures thorough dispersion in practically any equipment.

*1. Brightness 2. Viscosity 3. Particle Size 4. pH 5. Screen Residue 6. Adhesive Demand 7. Gloss 8. Opacity 9. Dispersion 10. Soluble Salts 11. Abrasion 12. Moisture 13. Suspension



At least 170 thousand forest fires start each year, burning more than 15,000,000 acres of timber land. Yet much of this shameful waste could be avoided, as nine out of ten forest fires are man-caused and preventable. Prevention of future fires down through the years is primarily a matter of organization and education.

The men and management of Weyerhaeuser Timber Company are keenly aware of the necessity of protecting forest lands from fire.

In the fall of 1941, Weyerhaeuser established the first officially designated "Tree Farm" at Montesano, Washington. Dedicated to the perpetual production of trees, Tree Farm rules require that adequate protective measures be instituted against fire, insects, and disease.

Today, all Weyerhaeuser Timber Company operating forest lands are tree farms, managed by skilled foresters. This tree farming system, wholeheartedly sponsored by Weyerhaeuser, guarantees the Pulp Division's customers an assured supply of woodpulp for the many years stretching ahead in the "cellulose age" in which we live.

WEYERHAEUSER

Brown Company Pulps DID IT FOR OZALID!

One of the world's most versatile reproduction papers is "Dryphoto"—a product of the Ozalid Division of General Aniline & Film Corporation. With it, completely dry photographic prints can be produced in a few seconds.

A special paper, "Dryphoto" called for a special-formula pulp, carefully engineered. And Brown Company provided special pulps that had just the required characteristics.

Coming up with the *right* pulps for special papers is a job Brown Company has been doing for more than half a century. For this work our research laboratories are unexcelled.

Perhaps the experts of our Technical Service Division can do for *you* what they did for Ozalid. If you have a paper problem write to Dept. BP-9, our Boston office.

BROWN QUALITY COMPANY, Berlin, New Hampshire
CORPORATION, La Tuque, Quebec

General Sales Offices: 150 Causeway St., Boston 14, Mass.—Dominion Square Bldg., Montreal, Quebec

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Dump Valves

8 Inch Valve Assembly

Answering a need for a superior dump valve for the paper industry, Rice Barton Dump Valves have the following advantages:

- Passages of valve are clear, smooth and unobstructed.
- Plug type flange used to eliminate any stock accumulation in valve.
- Gate of valve flush with floor of tank which prevents unpulped stock from pocketing above valve.
- Valve may be opened and closed from a remote location handy to operator.
- Either water or compressed air may be used for actuating valve.
- Discharge in any direction by swinging valve on bolt holes.

Construction — Valve body available in either cast iron or bronze.
Trim of bronze or stainless steel.

RBR 9-52

RICE BARTON Research Corporation

WORCESTER 1, MASS.

News about

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-get more advantages...with Hycar

IDEAL as a pigment binder in paper coating, Hycar latex provides an excellent printing surface and good adhesion properties. A better "front" for food packages, display signs, soap wrappers and more uses! No odor—and Hycar is compatible with casein and other resins.

That's just one phase of this versatile material's uses. When paper is impregnated with Hycar latex, its tear and wet strength are improved. Sheets drape smoothly, have a cloth-like feel. There are many uses for this softer, stronger, Hycar-improved paper: protective wrapping, bags, gasketing, tape backing, imitation leather base, shelf covering. More are possible.

And this, too: with Hycar-based adhesives you can permanently bond paper, wood, leather, aluminum foil and vinyl films to themselves as well as to other resins.

It's easy, safe and economical to use Hycar latex. It may be added to paper before or after sheet formation. No inflammable or hazardous solvents are needed. No costly recovery system or equipment required.

For helpful technical bulletins on the uses of Hycar latex, please write Dept. HM-10, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. In Canada: Kitchener, Ont. Cable address: Goodchemco.

B. F. Goodrich Chemical Company
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American Rubber

GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers • HARMON organic colors

Full Electric Fork Truck Operation in 6 FOOT AISLES*

The ALL NEW LEWIS-SHEPARD SPACEMASTER MODEL "M"

at ½ the usual Electric Fork Truck cost

Straddle Type
3000-4000 lbs.
capacity

40% More Storage Space . . . The "M" uses only 6 feet of this 10 foot aisle, leaving room for an extra row of stacked loads.

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*With 42" long, 48" wide loads

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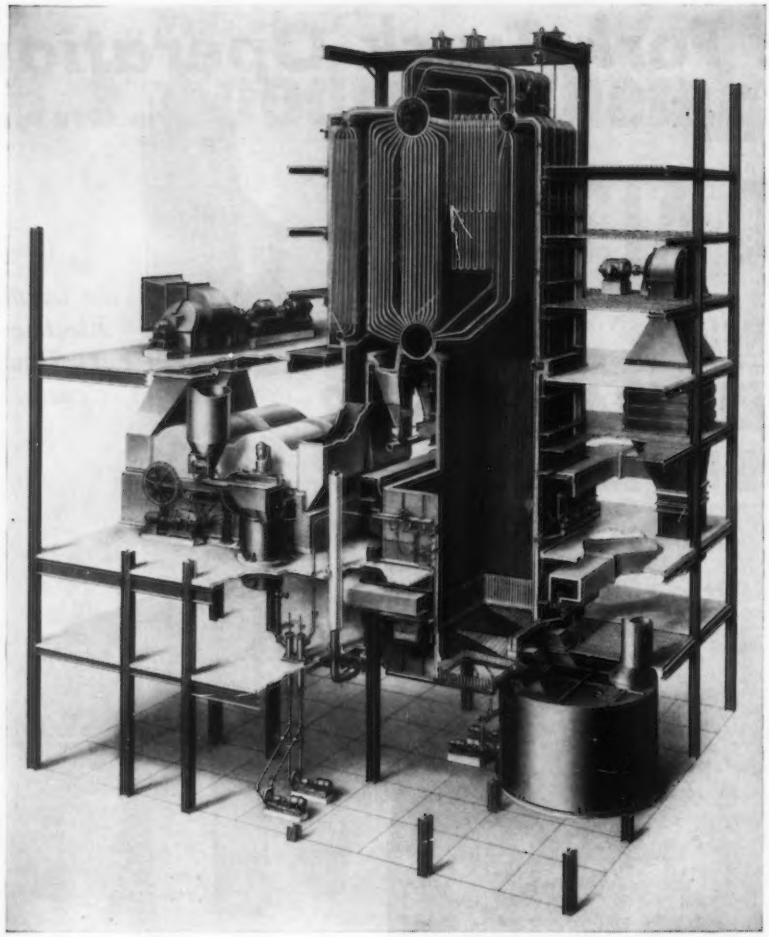
Company_____

Street_____

City_____ State_____



They keep coming back for more

The highest expression of satisfaction that can be accorded an installation of industrial equipment — or almost anything else for that matter — is that it be selected again and again by the same discerning purchasers.

Measured by that standard alone, the C-E Recovery Unit has an enviable record. Consider the list of pulp and paper companies at the right — a veritable "Who's Who" in the field — that have ordered and reordered the C-E Recovery Unit.

Four of these companies have ordered this equipment on four separate occasions. For example — one company ordered first in 1937, then in 1940, again in 1944 and again in 1950.

Three of the listed companies have ordered C-E Recovery Units three times. The rest have ordered twice.

Only superior performance could account for this record. Such performance explains why users of C-E Recovery Units "keep coming back for more".

Companies that have re-ordered C-E Recovery Units one or more times since 1937.

Brown Corporation
Champion Paper & Fibre Co., The
Chesapeake Corporation
Dryden Paper Company, Ltd.
Enso-Gutzeit Osakeyhito
Gaylord Container Corporation
Longview Fibre Company
MacMillan Export Co., Ltd.
National Container Corporation
North Carolina Pulp Company
Potlatch Forests, Inc.
St. Joe Paper Company
St. Regis Paper Company
Union Bag & Paper Corporation

C-E

COMBUSTION ENGINEERING—SUPERHEATER, INC.

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Canada: Combustion Engineering Corporation, Ltd.
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B-611

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A SIGNIFICANT ADVANCE IN AGITATOR ENGINEERING

Twelve years ago -- the last word in propeller agitators

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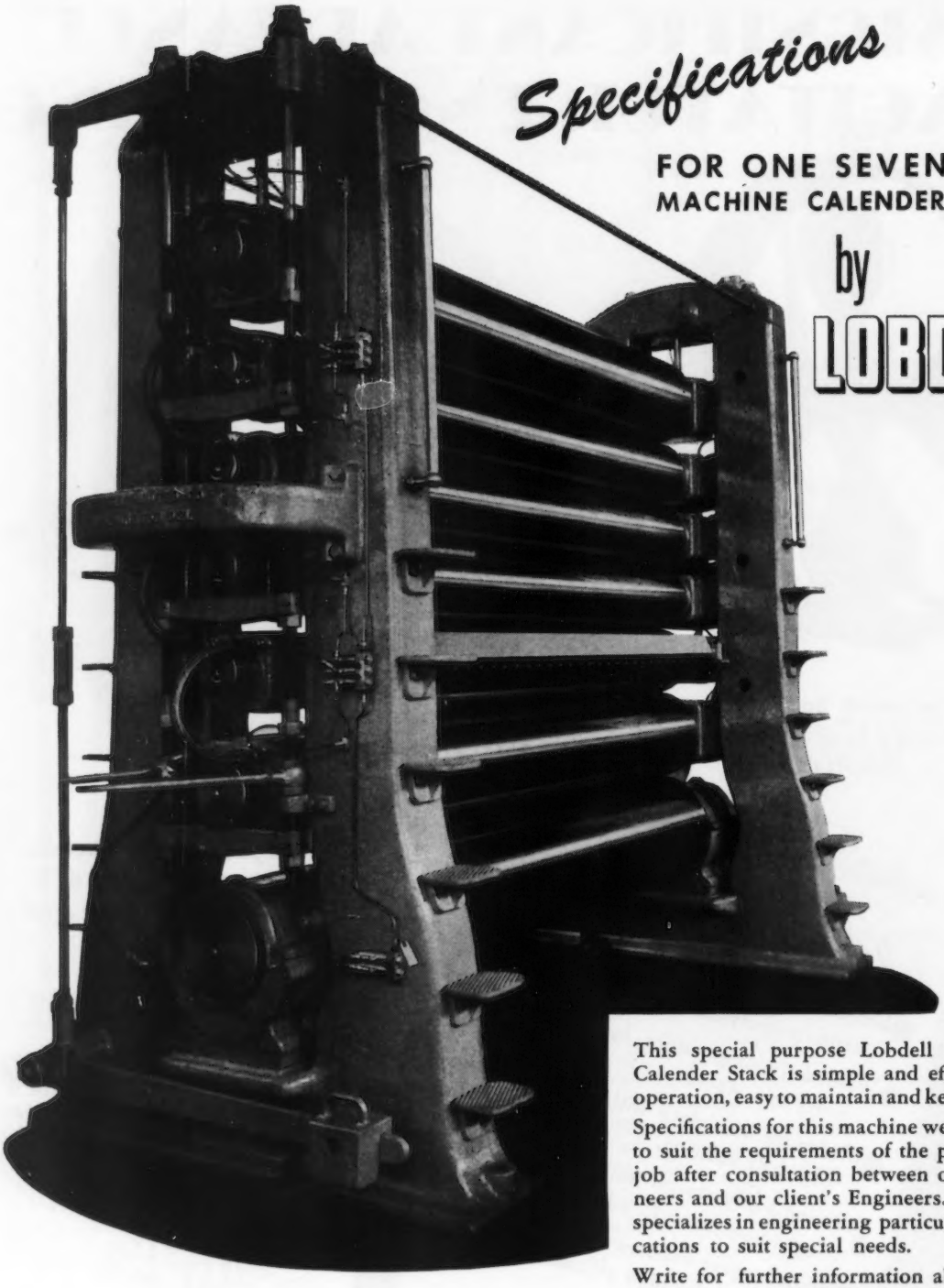
Impco Improvements

- Broader blades for higher consistence stock propulsion.
- Warped leading edges for shockless entry into stock.
- Blades tilt into place without disturbing shaft position.
- Bolted blades as on ship propellers -- set screws abandoned.
- Propeller ring has tapered suction and discharge for high efficiency propulsion.
- Hubs and spider arms are streamlined to avoid stock hang-up.
- Available in twelve different sizes.

IMPROVED PAPER MACHINERY CORPORATION
Nashua, New Hampshire

IMPCO

Sherbrooke Machineries Limited manufacture similar equipment in Canada



Specifications

FOR ONE SEVEN-ROLL MACHINE CALENDER STACK

by LOBDELL

This special purpose Lobdell Machine Calender Stack is simple and efficient in operation, easy to maintain and keep clean.

Specifications for this machine were set-up to suit the requirements of the particular job after consultation between our Engineers and our client's Engineers. Lobdell specializes in engineering particular applications to suit special needs.

Write for further information about this and other Lobdell Machine Calender Stacks. Lobdell also manufactures: Roll Grinding Machines, Micrometer Roll Calipers and Chilled Iron and Alloy Chilled Rolls.

1836 **LOBDELL UNITED COMPANY** 1952

WILMINGTON 99, DELAWARE

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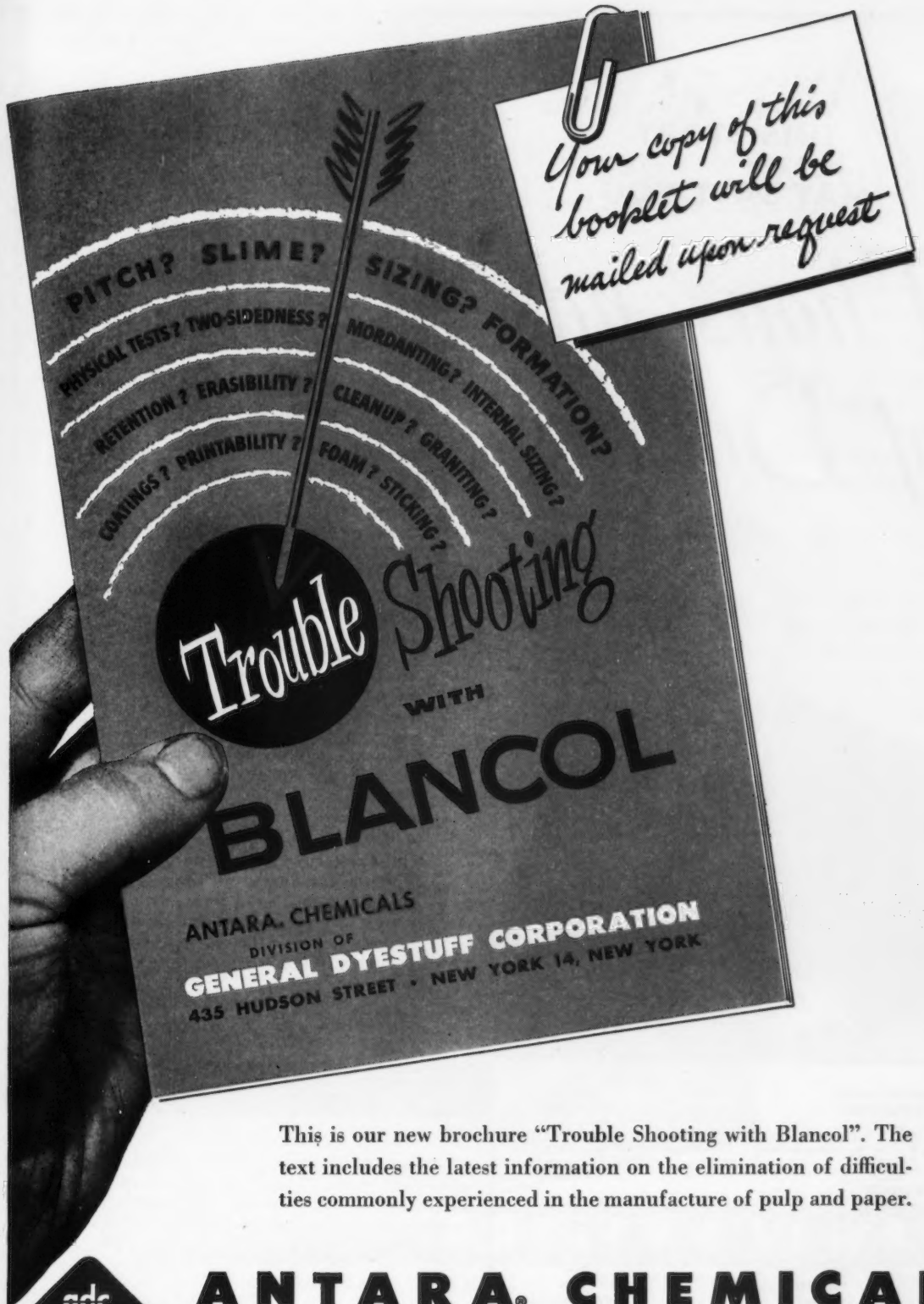
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PHYSICAL TESTS? TWO-SIDEDNESS? MORDANTING? INTERNAL SIZING?
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COATINGS? PRINTABILITY? FOAM? STICKING?
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DIVISION OF
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This is our new brochure "Trouble Shooting with Blancol". The text includes the latest information on the elimination of difficulties commonly experienced in the manufacture of pulp and paper.

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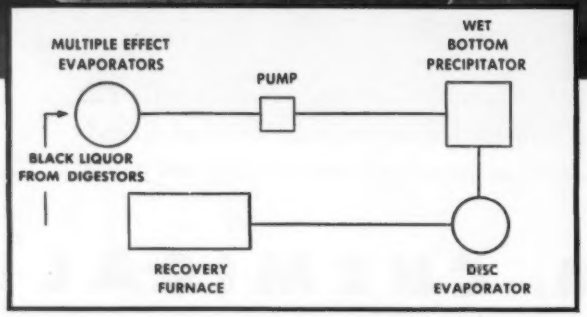
WET RECOVERY SYSTEM

for Electrical Precipitators

A shortcut in the recovery of chemical compounds from Recovery Furnace Stack Gas offered by Research Corporation, assures an appreciable saving in operating and maintenance cost. That's because the new Wet Recovery System gets the precipitated dust into the black liquor as soon as possible after it has been removed from the gas.

Instead of collecting dust in hoppers at the bottom of the precipitator and conveying it, in the dry state, to black liquor tanks, the new method utilizes a liquor sump or tank directly under and an integral part of the Cottrell Precipitator. Black liquor flows to this wet bottom where the recovered dust is taken up in solution or suspension. In this continuous process, the black liquor discharges to the feed going to the disc evaporators.

The Wet Recovery System does away with handling dust in the dry state. It eliminates steam coils and heat insulation formerly needed to prevent condensation in the hoppers. It obsoletes such expensive equipment as hopper vibrators and steam-jacketed conveyors.



COMMERCIAL installations have proved the economy of this new system. They have demonstrated, too, that dust collection efficiency remains as high with the wet recovery system. For complete data, write for Editorial Reprint P-1.

RESEARCH CORPORATION

405 Lexington Ave., New York 17, N. Y.
122 South Michigan Avenue, Chicago 3, Illinois
Bound Brook, New Jersey

RC-132

WRENN PAPER COMPANY

SELECTS B&S

SHEAR-CUT SLITTER-REWINDER

The Wrenn Paper Company, widely recognized for its high quality products, was faced with the problem of slitting a hard-to-handle material. Clean, square edges and uniformly wound rolls were of utmost importance.

After considering several machines, the Bagley & Sewall #15 Shear-Cut Slitter-Rewinder was selected.

B & S Slitters and Rewinders are doing outstanding jobs in mills and converting plants all over the country. Their many unique money-saving advantages make them the first choice of the industry. Before you buy, *compare*...and your choice, too, will be B & S Slitting and Rewinding equipment.

For full details write to The Bagley & Sewall Company, Watertown, New York.

Inserts show Shear-Cut Slitter Units

BAGLEY & SEWALL

designers and builders of **PAPERMAKING MACHINERY**

SINCE 1853

WATERTOWN, NEW YORK

Foreign Representative: **EASTLE & OVERTON, INC., 630 Fifth Avenue, New York 20, N. Y.**

for Versatility and Economy

the CALCO BLACKS

NIGROSINE J NIGROSINE O2P
NIGROSINE OPX
PHENO BLACK SGN CONC. DUSTLESS

The CALCO BLACKS produce deep shades economically and act as dependable shading elements in grays, blues, browns, tans, greens and reds. They assure uniform results on a variety of fibres for tissue, bag, wrapping, kraft and specialty papers.

The Blacks are just one group in an extensive line of efficient Calco colors for paper. Your Calco representative will gladly supply full information about them.

Calco®

AMERICAN Cyanamid COMPANY

CALCO CHEMICAL DIVISION, DYESTUFF DEPARTMENT
BOUND BROOK, NEW JERSEY
NEW YORK • CHICAGO • BOSTON • PHILADELPHIA • CHARLOTTE • PROVIDENCE

REPRESENTED IN CANADA BY NORTH AMERICAN CYANAMID LIMITED, CALCO CHEMICAL DIVISION, MONTREAL—TORONTO

3 new features

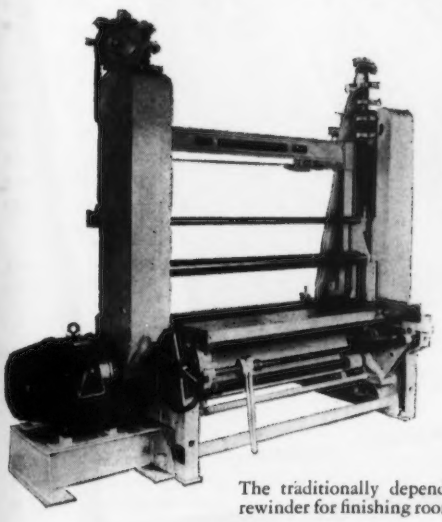
for improved roll quality and reduced maintenance cost

These three new design features of the Camachine Commander virtually eliminate vibration and provide for superior strip control:

1. **Riding Roll Drive:** Impregnated woven flat belts and crowned pulleys drive the riding roll from *both* ends. Adjustable tension apparatus automatically establishes *equal* tension on *both* riding roll belts, and permits variation of riding roll torque to suit the material characteristics.
2. **Rewind Shaft Bearings:** The rewind shafts are mounted in ball thrust bearings which are contained in sliding carriages in the vertical guide bars. The carriages are fitted to eliminate end play of the shafts.
3. **Rewind Drum Drive:** Positive toothed belts, which require no lubrication, are used to transmit driving power to the front and rear rewind drums.

For complete details on the new Camachine Commander write for Bulletin 2000.

CAMERON MACHINE CO. • 61 Poplar Street, Brooklyn 2, N. Y.



The traditionally dependable heavy-duty slitter-rewinder for finishing rooms and converting plants.

The New CAMACHINE COMMANDER TYPE 10

•

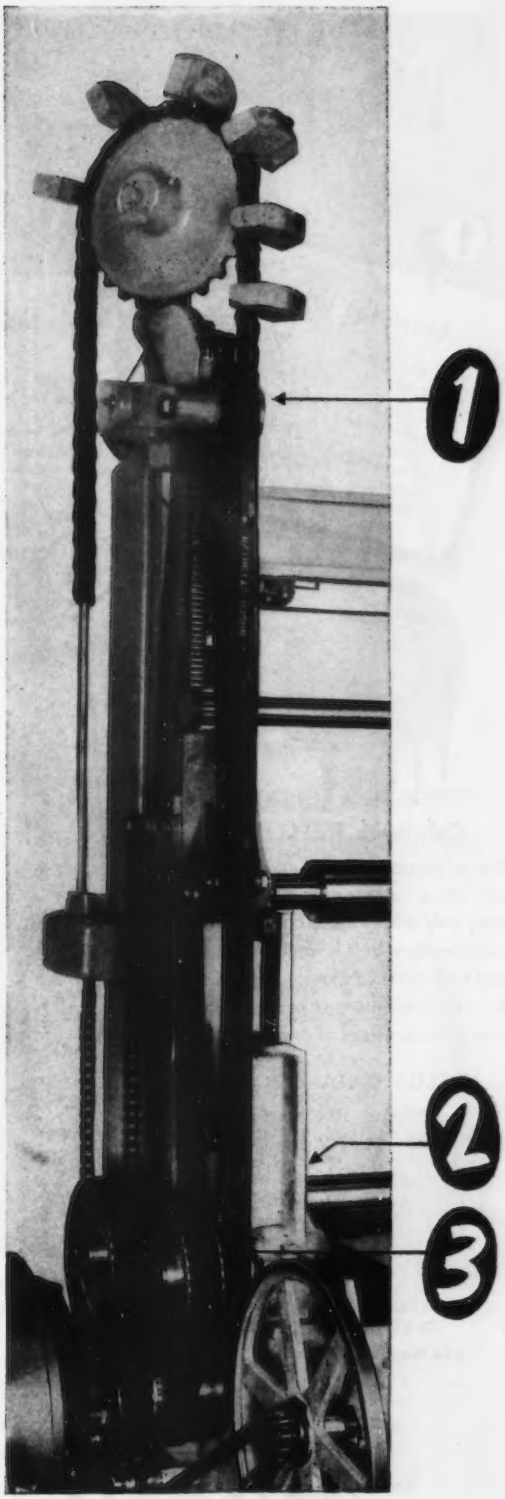
Speeds up to 2000 FPM

•

Widths from 42" to 82"

•

Rewind dia. up to 40"



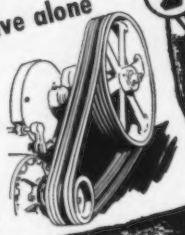
LOOK FOR ENGINEERING LEADERSHIP AND YOU'LL WIND UP WITH Camachines®

AA-258

What do you do when your v-belts get loose or break?

1 **Leave the drive alone**

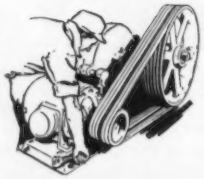
You get more slippage
- ...wasted power
- ...excessive belt wear
- ...uneven sheave wear
- ...less production



2 **Slide the motor back**

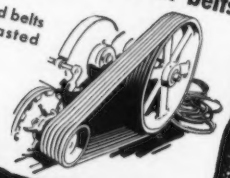
Tight belts get too tight

Life of belts and bearings is reduced



3 **Install a new set of belts**

Discarded belts mean wasted money



4 **Use VEELOS...**

Only with VEELOS...

the adjustable v-belt—can you get *all* these operating advantages. And *only* with Veelos can you eliminate costly v-belt inventory because just four reels of Veelos in the O, A, B and C widths can replace up to 316 different sizes of endless v-belts.

VEELOS DATA BOOK...

The plain facts on construction, installation and use of Veelos are included in this illustrated Data Book —write for your copy.

MANHEIM MANUFACTURING & BELTING COMPANY
616 Manbel St., Manheim, Pa.

Link construction permits quick installation
Easy adjustability
...provides controlled tension on each belt
...eliminates loafers
Keeps your machines running for *profitable* production

VEELOS
THE LINK
V-BELT

ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

Made in all widths in three types: regular, oil-proof, static conducting. Also double V in O, A and B. Packaged on reels in 100-foot lengths. Sales engineers in principal cities; over 350 distributors throughout the country. VEELOS is known as VEELINK outside the United States.

WHAT WOULD **YOU** SPECIFY . . .

Service	Fluid	Type of Valve	Valve Material
1 Sulphite Mill	White Water (Acid)		
2 Soda Mill	Black Liquor		
3 Beater Room	Alum Lines		
4 Bleach Mill	Bleach Liquor		
5 Pulp Mill	Paper Stock		
6 General Service	Compressed Air		

We recommend Grinnell-Saunders Diaphragm Valves with . . .

Body Material	Diaphragm Material
1 Rubber Lined	Rubber
2 Cast Iron	Neoprene
3 Glass Lined	Butyl
4 Rubber Lined	Rubber
5 18-8 Stainless	Neoprene
6 Cast Iron	Neoprene

In several of these cases other body materials or diaphragms would serve as well. But the really important fact is the unmatched versatility of Grinnell-Saunders Diaphragm Valves in handling corrosive fluids, gases, compressed air, food and suspended solids . . . in lines where corrosion, abrasion, contamination, clogging, leakage and maintenance are problems.

Grinnell-Saunders Valve bodies are stocked in cast iron, malleable iron, stainless steel, bronze, and aluminum, with other materials available on special order. Valve bodies can be lined with lead, glass, natural rubber or neoprene. Diaphragms are available of natural rubber and a number of synthetics to suit particular service conditions.

The Grinnell-Saunders Valve Division will be pleased to submit recommendations upon receipt of complete information covering service conditions.

Features of the Grinnell-Saunders Diaphragm Valve

- diaphragm absolutely isolates working parts from fluid
- diaphragm lifts high for streamlined flow in either direction
- diaphragm presses tight for positive closure
- body, lining and diaphragm materials to suit service
- simple maintenance—diaphragm easily replaced

GRINNELL

WHENEVER PIPING IS INVOLVED

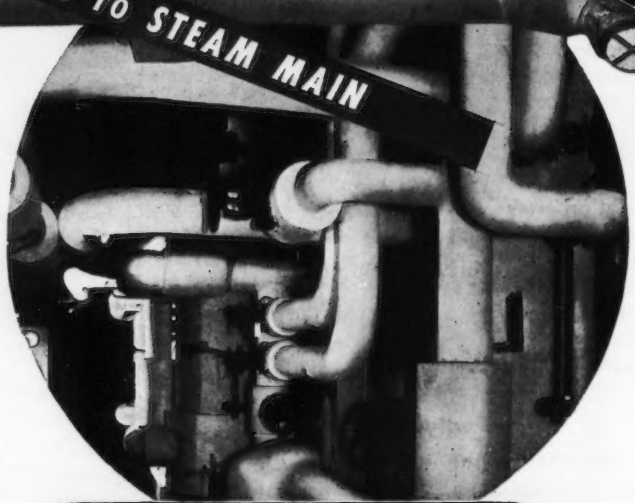
Grinnell Company, Inc., Providence, Rhode Island • Coast-to-Coast Network of Branch Warehouses and Distributors

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies
industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems

WHEN THE PRESSURE IS ON P.P.&E. PIPING

has what it takes

FROM CONTROL PIPING TO STEAM MAIN



Today's 1000°F and higher temperatures, combined with pressures in the 2000 psi range — really "put the pressure" on a piping system. It could be said that these higher, and perhaps even higher pressures to come, will force new standards of piping.

But—remember when 750°F was considered to be a high reheat temperature? Even then, P.P.& E. was ahead of the needs in piping to carry the load. As the trend toward higher temperatures continued—P.P.& E. has kept ahead of the requirements.

That's why conditions encountered in present-day reheat temperatures are thoroughly understood by P.P.& E. engineers—and why adequate materials, design know-how, methods of treating and fabricating, and testing procedures are available.

When the "pressure is on" you can depend on every part of a P.P.& E. piping system—from the steam main, right down to the air lines.

Pittsburgh Piping

AND EQUIPMENT COMPANY

10 Forty-Third Street—Pittsburgh, Penna.

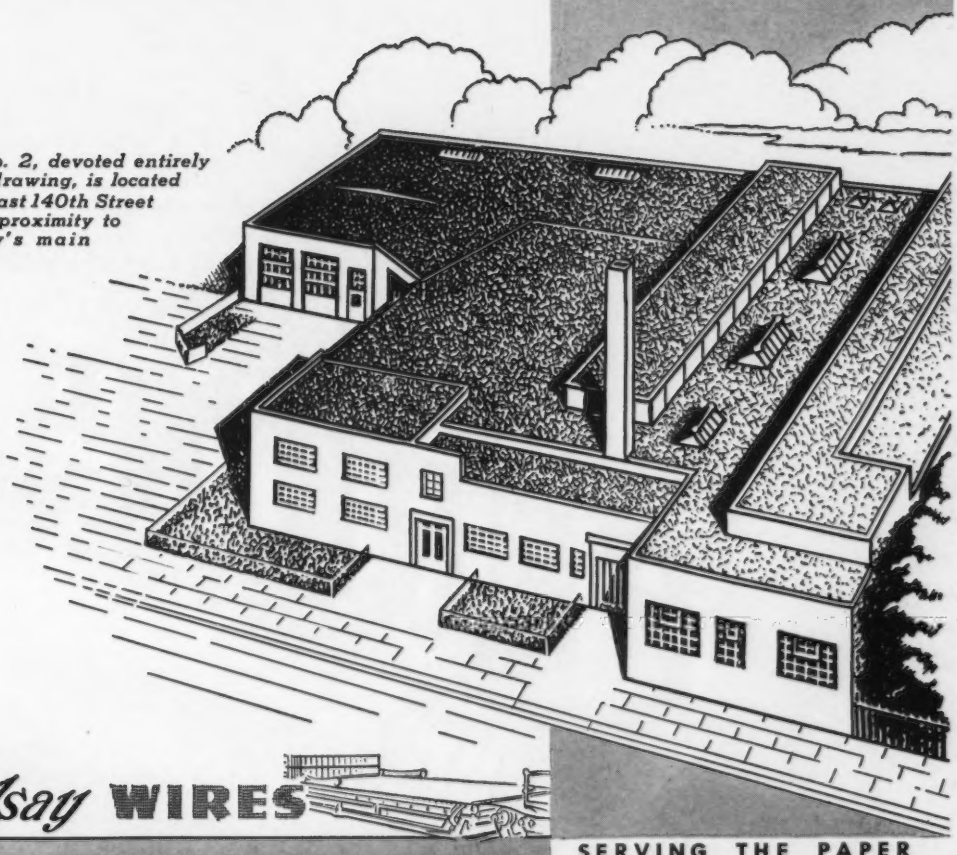
Woolworth Building, New York
Whitehead Building, Atlanta
Book Tower, Detroit
785 Market Street, San Francisco
Peoples Gas Building, Chicago
Public Square Building, Cleveland
10 High Street, Boston
Heights State Bank Bldg., Houston

Another *Lindsay* PLANT

COMPLETELY INTEGRATED FOR WIRE DRAWING

The quality of Lindsay Fourdrinier wires is still further assured. Wire drawing has become a completely integrated operation in Plant No. 2, laid out and specifically equipped for this single purpose. Thus the growth suggested at the left continues, but with unremitting reference to excellence and uniformity of product. The Lindsay Wire Weaving Company.

Plant No. 2, devoted entirely to wire drawing, is located at 835 East 140th Street in close proximity to Lindsay's main plant.

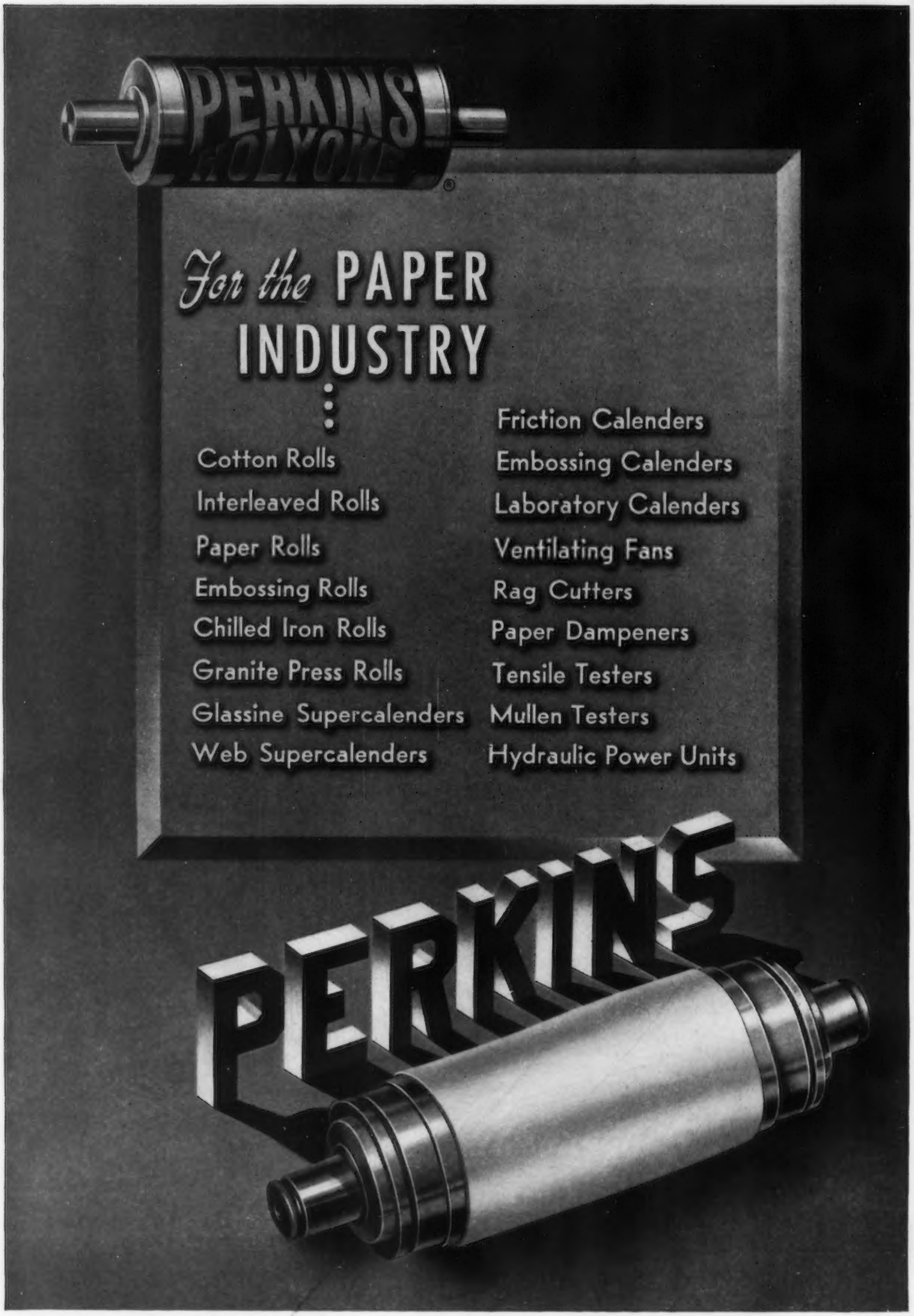


Lindsay **WIRES**

FOR PAPER MILLS

SERVING THE PAPER INDUSTRY SINCE 1903

CLEVELAND 10, OHIO


PERKINS
ROLYON
For the PAPER INDUSTRY
Cotton Rolls
Interleaved Rolls
Paper Rolls
Embossing Rolls
Chilled Iron Rolls
Granite Press Rolls
Glassine Supercalenders
Web Supercalenders
Friction Calenders
Embossing Calenders
Laboratory Calenders
Ventilating Fans
Rag Cutters
Paper Dampeners
Tensile Testers
Mullen Testers
Hydraulic Power Units
PERKINS

CUTTING OPERATING COSTS

WITH A MARX SAVEALL

This 1,000-gal.-per-min. Marx Saveall is recovering 3.325 lbs. of fiber per 1,000 gals. of white water effluent for Fleming & Sons of Dallas, Texas. The recovery of suspended fiber previously lost, reduces operating costs by the actual value of the fiber saved and by permitting the water to be used again.

Approximately 250 tons of paper board is produced every 24 hours at the Fleming & Sons plant. About half of this output, or 125 tons, is made on units served by the Marx Saveall. White water effluent passed through the Saveall has a reduction in suspended matter from 3.5 lbs. per 1,000 gals. to less than .175 lbs. per 1,000 gals. That means the Saveall is operating at approximately 95 per cent efficiency.

A primary advantage of the Marx Saveall is that no chemical coagulants are used. Settlement of fibers takes place as a result of the kinetic energy of the falling liquid from the feed cone on to the deaeration cone. No moving parts are involved, thus there is no likelihood of mechanical failure occurring. Maintenance costs are also kept to a minimum.

Marx Savealls are typical examples of the special steel plate structures we build for pulp and paper mills. Let our engineers work with you on your next steel plate requirements.

1,000-gal. per min. Marx Saveall built for Fleming & Sons at Dallas, Texas.

HOW THE MARX SAVEALL WORKS

The Marx Saveall consists primarily of two large steel plate cones, one mounted inside the other. The inner cone is relatively short with a large opening at the bottom.

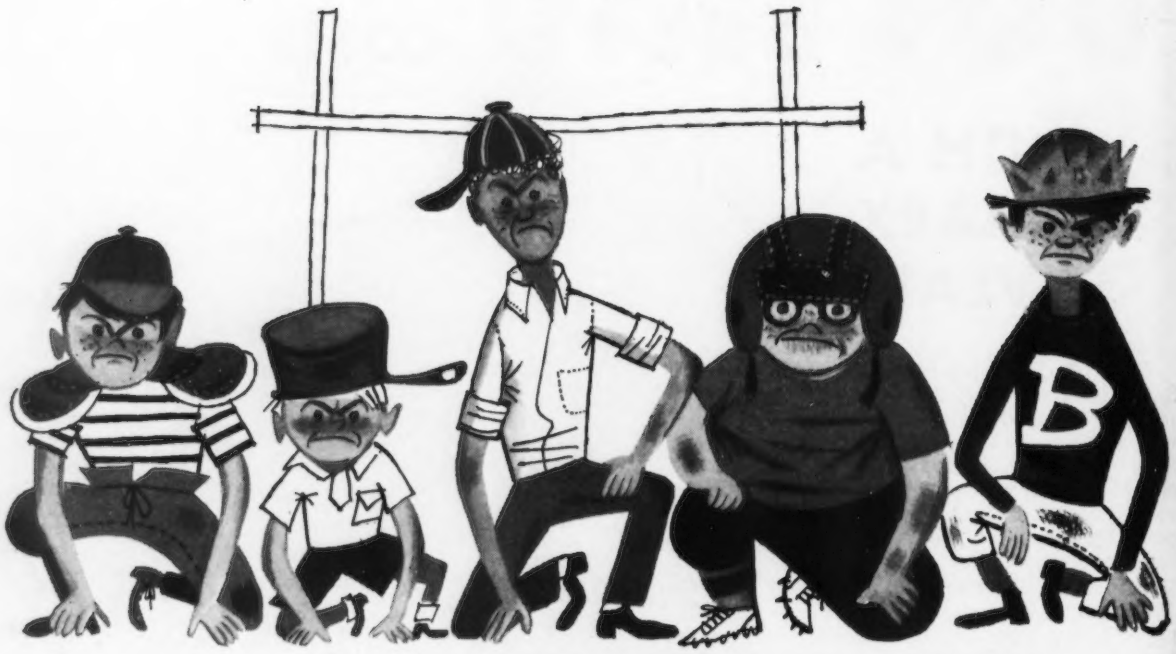
A small receiving well at the top of the unit, with an inverted deaeration cone directly underneath, receives the waste white water and allows it to overflow on to the deaeration plate (where the air bubbles are shaken loose from the solid particles) and run off its edge. Suspended fibers settle through the inside cone and collect in the bottom of the outside cone. Water, minus most of the solids, rises between the two cones and flows over a circular weir into a draw-off channel. The fibers collecting in the bottom of the unit are drawn off periodically and re-used.

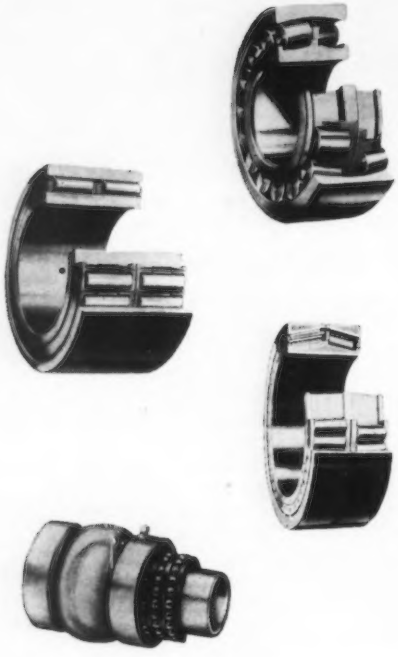
CHICAGO BRIDGE & IRON COMPANY

Atlanta, 3.....2142 Healey Building
Birmingham, 1.....1559 North 50th Street
Boston, 10.....1064—201 Devonshire Street
Chicago, 4.....2130 McCormick Building
Cleveland, 15.....2255 Guildhall Building
Detroit, 26.....1565 Lafayette Building
Havana.....402 Abreu Building
Houston, 2.....2163 C & I Life Building
Los Angeles, 17..1561 General Petroleum Building
New York 6.....3333—165 Broadway Building
Philadelphia, 3..1665—1700 Walnut Street Building
San Francisco, 4.....1577—200 Bush Street
Seattle, 1.....1368 Henry Building
Tulsa, 3.....1666 Hunt Building
Washington 6, D. C.....1170 Cafritz Building

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA.

In Canada: HORTON STEEL WORKS, LIMITED, FORT ERIE, ONT.





all types...

Many builders and users of mechanical equipment have found the answer to their anti-friction bearing needs at Torrington which makes all basic types.

Torrington spherical roller, tapered roller, straight roller, needle and ball bearings are available in a wide variety of sizes. And when a standard type "won't do", Torrington designs special bearings tailored to the job.

So whether you need an unbiased recommendation for the standard bearing best suited to your application or a special bearing, Torrington is always ready to serve you. Call the office nearest you.

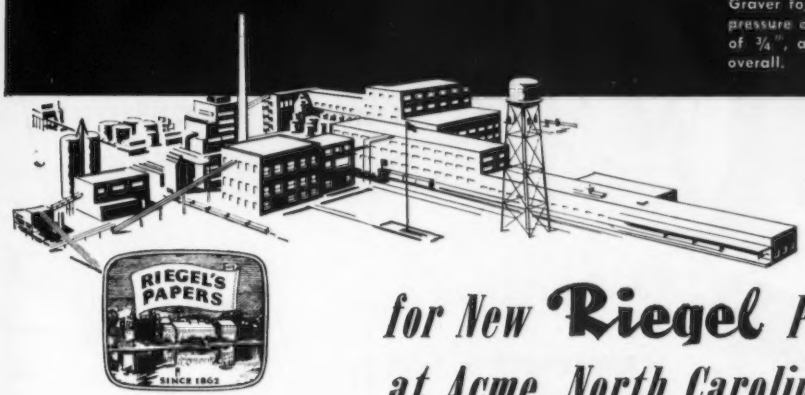
THE TORRINGTON COMPANY
Torrington, Conn. South Bend 21, Ind.
District Offices and Distributors in Principal Cities of United States and Canada

TORRINGTON BEARINGS

Spherical Roller • Tapered Roller • Straight Roller • Needle • Ball • Needle Rollers

GRAVER builds
5 Stainless-Clad Digesters—

One of the five stainless clad digesters fabricated by Graver for the Riegel Corporation. Built for working pressure of 126 PSI, each has a total shell thickness of ¾", an inside diameter of 11', and stands 48' overall.



A leader in paper making since 1862, the Riegel Corporation produces more than 600 different kinds of paper, with glassine and greaseproof papers its largest lines. The recent addition of a pulp mill permits Riegel to integrate its every operation from tree to finished paper.

for New Riegel Pulp Mill at Acme, North Carolina

The vital part these five digesters play in Riegel's new pulp mill demanded fabrication of the highest order. Top efficiency, long, dependable service, and minimum down-time were "musts". By intensive research and painstaking fabrication, Graver's goal was not only the fulfilling of these requirements, but in addition the elimination of other operating problems inherent in the usual digester. These very real evidences of Graver ability are worth remembering whenever fabrication in steel or alloys is *your* need.

GRAVER TANK & MFG. CO., INC.
EAST CHICAGO, INDIANA
NEW YORK • CHICAGO • PHILADELPHIA • DETROIT • WASHINGTON
CINCINNATI • CATASAUQUA, PA. • HOUSTON • SAND SPRINGS, OKLA.

GRAVER

HAM FELTZ says:

Down Time is Costly

An idle paper or board machine, like an idle horse, eats its head off. But, unlike a horse, a machine does not need to take time out for rest. Consequently some mills can afford to pay time-and-a-half for over-time labor. They make up the difference by the extra economy of continuous machine operation.

Not so with felts. Felts do get tired before they wear out. A tired felt can't remove as much water as a fresh felt can remove in a given time. When you have to reduce speed or to increase the heat at the driers you know that it is time to replace felts.

Year after year for almost a century, mill superintendents have been well satisfied with Hamilton Felts.

The Hamilton Sales Engineer will be glad to work overtime when you are ready to talk felts.

Hamilton Felts

MIAMI WOOLEN MILLS

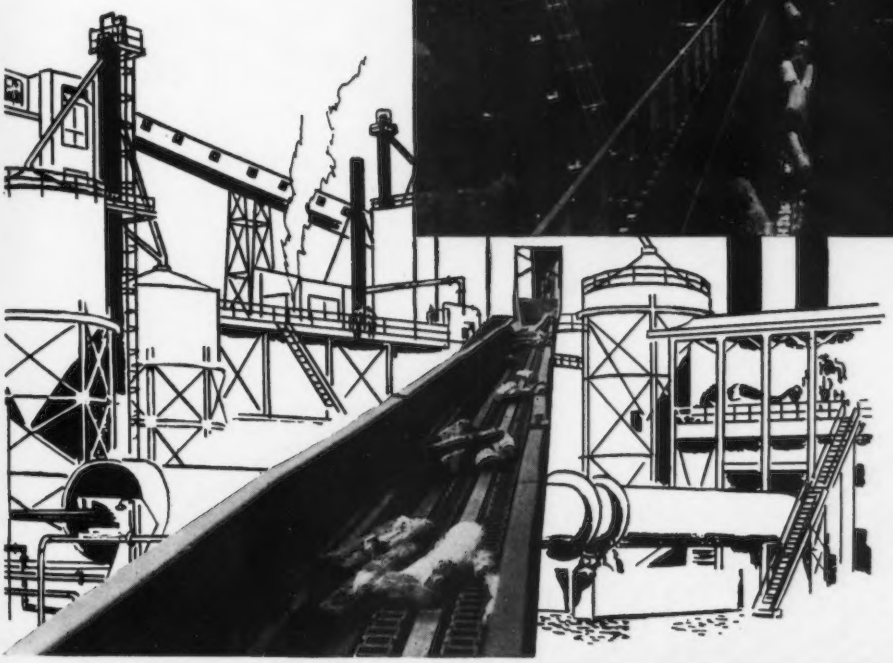
Established 1858

SHULER & BENNINGHOFEN, HAMILTON, OHIO

modern mechanization
from pulpwood to paper

Look to Jeffrey for the latest improvements in material handling —whether for logs, pulpwood or finished product.

When it comes to feeding, crushing, shredding, conveying or elevating—Jeffrey has both the experience and equipment to help step up production in pulp and paper mills.



- Chain Conveyors
- Belt Conveyors
- Spiral Conveyors
- Chemical Feeders
- Bucket Elevators
- Barge Unloaders
- Crushers and Shredders
- Re-chippers
- Log Haul-ups
- Transmission Machinery

THE JEFFREY

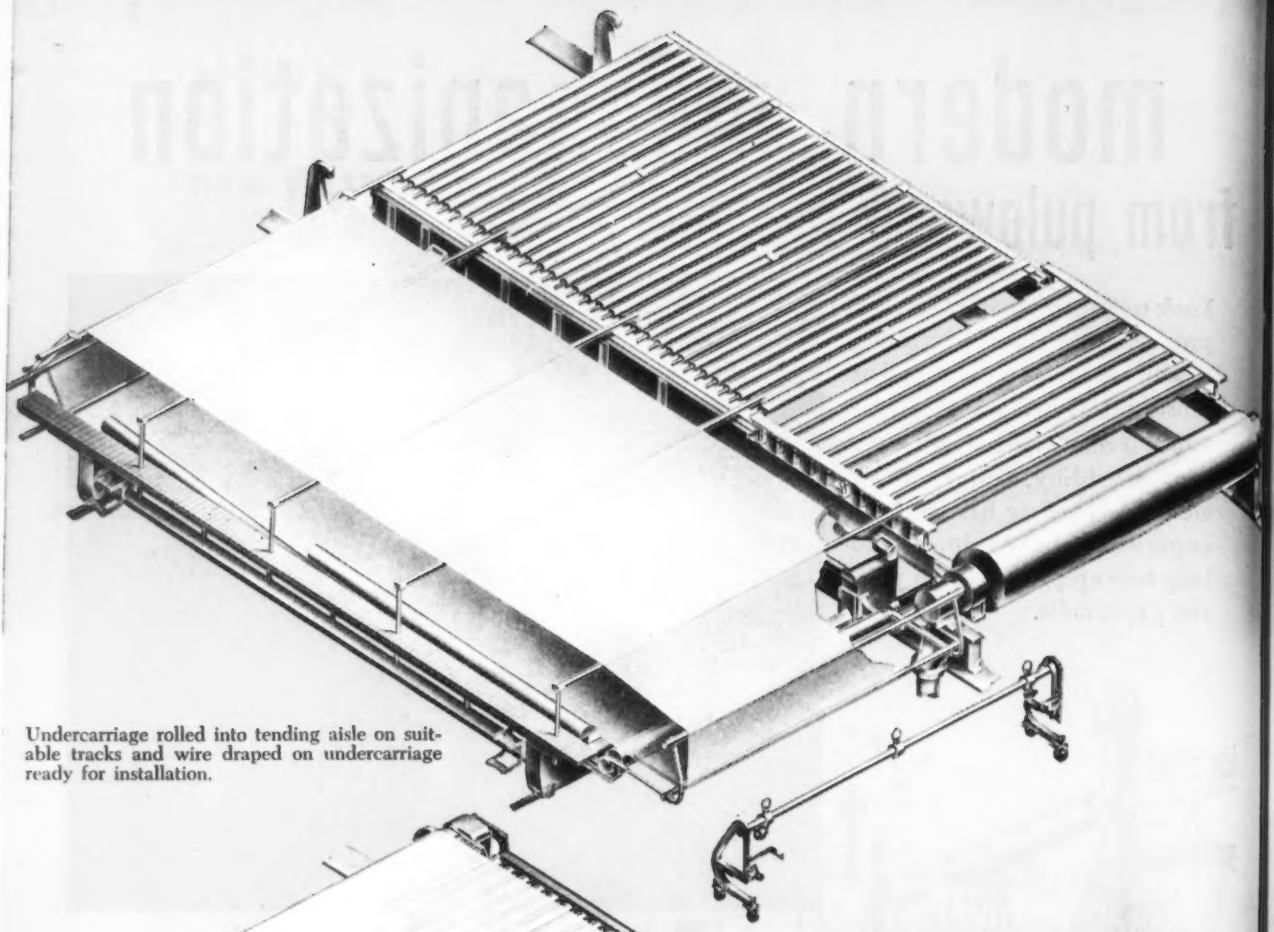
1877 75 YEARS 1952

MANUFACTURING COMPANY Established 1877

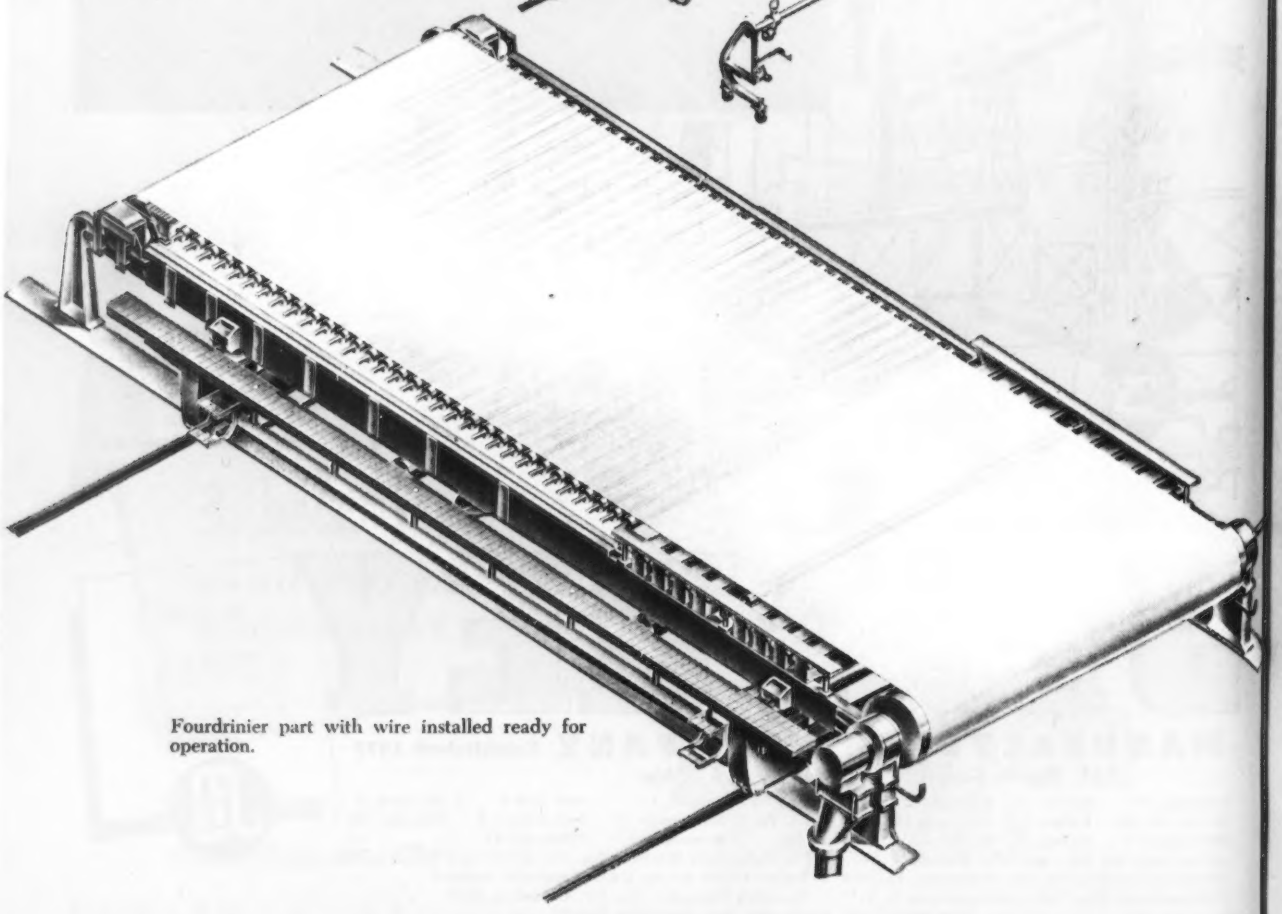
931 North Fourth St., Columbus 16, Ohio

Baltimore 2 · Beckley, W. Va. · Birmingham 3 · Boston 16 · Buffalo 2 · Chicago 1 · Cincinnati 2 · Cleveland 15 · Denver 2 · Detroit 13 · Forty Fort, Pa. · Harlan, Ky. · Houston 2 · Jacksonville 2 · Milwaukee 2 · New York 7 · Philadelphia 3 · Pittsburgh 22 · St. Louis 1 · Salt Lake City 1

Jeffrey Mfg. Co. Ltd., Montreal, Canada
British Jeffrey-Diamond Ltd., Wakefield, England
Jeffrey-Galion (Pty.) Ltd., Johannesburg, S. A.
The Galion Iron Works & Mfg. Co., Galion and Bucyrus, Ohio
Galion (Great Britain Ltd.), Wakefield, England
The Ohio Malleable Iron Co., Columbus, Ohio
The Kilbourne & Jacobs Mfg. Co., Columbus, Ohio



Undercarriage rolled into tending aisle on suitable tracks and wire draped on undercarriage ready for installation.



Fourdrinier part with wire installed ready for operation.

Fourdrinier part of "Rapi-Drape" design.

"RAPI-DRAPE" Scores Again

"Rapi-Drape" Wire Handling is now being used successfully in these outstanding mills:

P. H. Glatfelter Co., Spring Grove, Pa.
Southland Paper Mills, Inc., Lufkin, Texas
Hollingsworth & Whitney Company, Mobile, Ala.
Southern Advance Bag & Paper Co., Hodge, La.
St. Mary's Kraft Corp., St. Mary's, Ga.
Union Bag & Paper Corp., Savannah, Ga. (2)
Hudson Pulp & Paper Corp., Palatka, Florida (2)
Southern Paper Board Corp., Port Wentworth, Ga.
Fibreboard Products Inc., East Antioch, Calif.
St. Regis Paper Co., Tacoma, Wash.
Calcasieu Paper Co., Elizabeth, La.
San Rafael Paper Co., Mexico, D. F.
Papierfabrik Utzenstorf, Switzerland
National Newsprint Co., Ltd., India
Container Corp. of America, Cali, Colombia, S. A.
Brown Paper Mill Co., Monroe, La.

On order for:

Nekoosa Edwards Paper Co., Port Edwards, Wis.
Union Bag & Paper Corp., Savannah, Ga.
St. Joe Paper Co., Port St. Joe, Fla.
West Tacoma Newsprint Co., Tacoma, Wash.
Fraser Paper, Ltd., Madawaska, Me.
Camp Mfg. Co., Franklin, Va.

One of the largest southern mills reports a complete wire changing record of 65 minutes down-time from reel to reel. This particular fourdrinier wet end is equipped with wire 236" wide and 120 ft. long.

In addition to all new Puseyjones machines equipped with this efficient wire changing device, the mills have found it profitable to change over old machines due to the many advantages obtained. Under construction at present are 3 fourdriniers, one 194", one 212" and one 220" wire width, equipped with "Rapi-drape" that will replace old style removable type originally supplied with each machine.

In "Rapi-drape" Wire Handling, pioneered by Puseyjones, the fourdrinier as a unit remains in the operating position. The back side of the fourdrinier is supported on rigid frames and the front side on a removable hydraulic power-operated under-carriage so that the fourdrinier is supported in perfect alignment at all times. It is unnecessary to detach the shake, suction boxes or shower piping. The only parts which must be removed are the dandy roll, deckle and cut squirts.

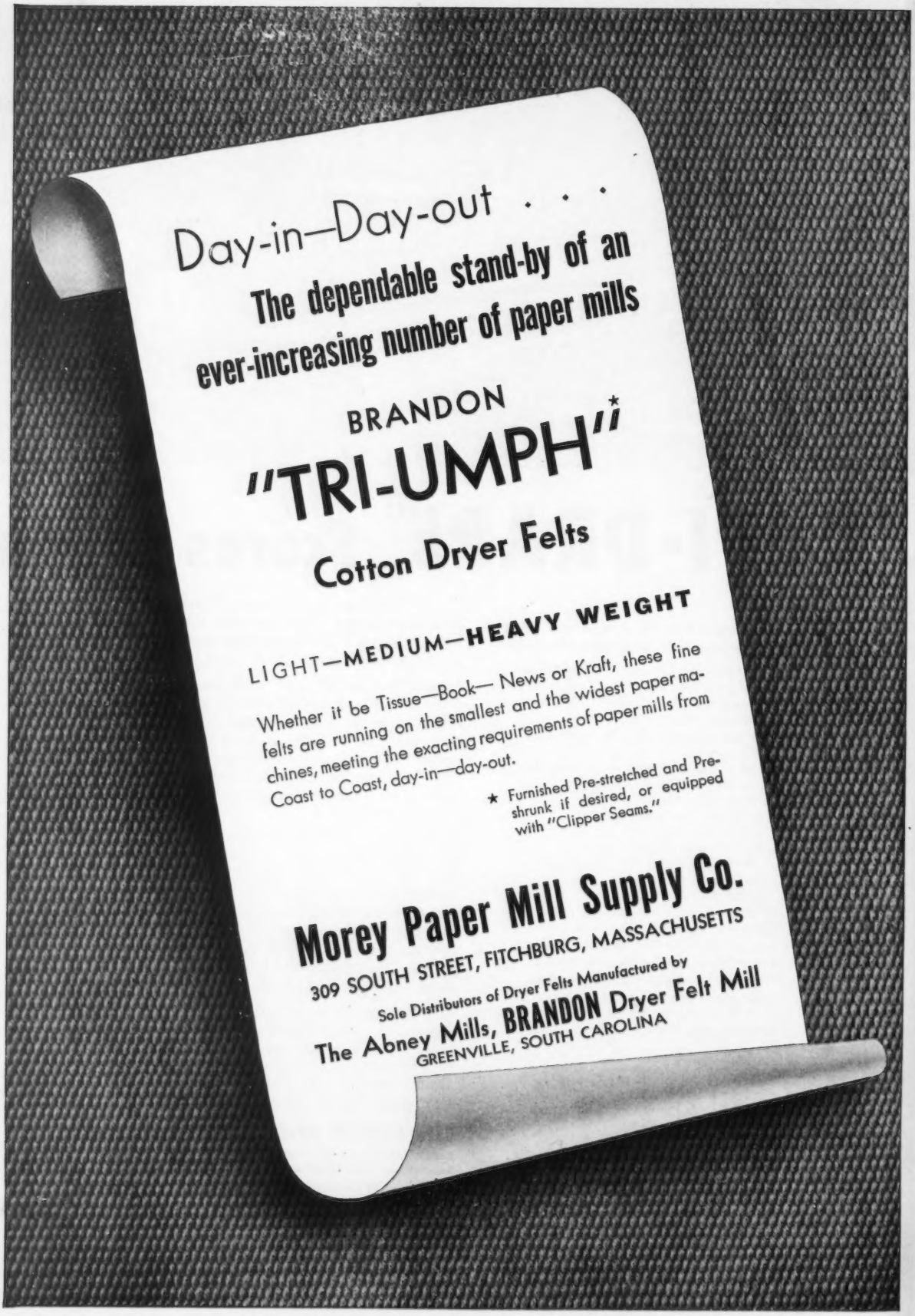
The results in terms of fast, safe wire handling are acclaimed by the many responsible operators and engineers who have this equipment in use. Be sure that your next machine is equipped with "Rapi-Drape" Wire Handling – one of many design improvements and labor-saving devices developed by Puseyjones.

THE PUSEY AND JONES CORPORATION

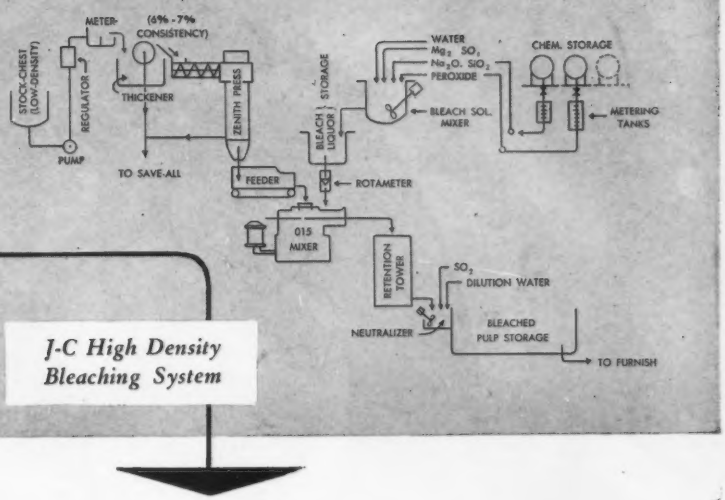
Established 1848. Builders of Paper-Making Machinery
Fabricators and Welders of all classes of Steel and Alloy Products

Wilmington 99, Delaware, U. S. A.

THE SIGN OF TRADE MARK SUPERIOR QUALITY


Day-in—Day-out . . .
The dependable stand-by of an ever-increasing number of paper mills
BRANDON
"TRI-UMPH"*
Cotton Dryer Felts
LIGHT—MEDIUM—HEAVY WEIGHT
Whether it be Tissue—Book— News or Kraft, these fine felts are running on the smallest and the widest paper machines, meeting the exacting requirements of paper mills from Coast to Coast, day-in—day-out.
★ Furnished Pre-stretched and Pre-shrunk if desired, or equipped with "Clipper Seams."
Morey Paper Mill Supply Co.
309 SOUTH STREET, FITCHBURG, MASSACHUSETTS
Sole Distributors of Dryer Felts Manufactured by
The Abney Mills, BRANDON Dryer Felt Mill
GREENVILLE, SOUTH CAROLINA

Jackson and Church — HIGH DENSITY SYSTEM

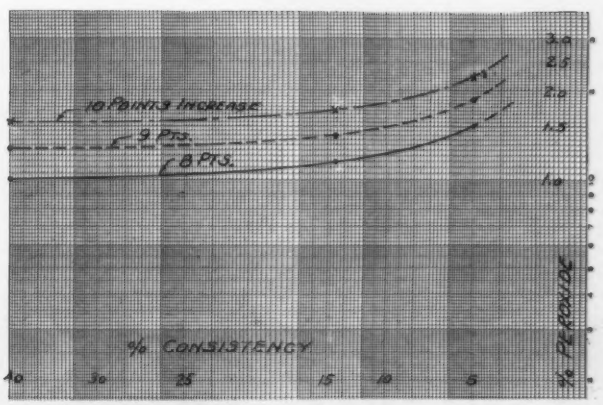


J-C High Density Bleaching System

SAVES 1/3 OF CHEMICAL COSTS

Recent tests performed under actual mill conditions proved savings of 12.8 pounds of bleach per ton of *groundwood* pulp. To a 100-ton plant this will mean a saving of 1,280 pounds of bleach in one day's operation by the High Density System, *or a saving in excess of $100,000 in a year.* Benefits from high density bleaching of sulphite pulp are comparatively greater.

The Jackson & Church High Density System incorporates the J-C Zenith Press and J-C Shredder Mixer because of their ability to handle high consistencies. Pulp mills are now able to realize substantial savings by changing from low density with its higher bleach costs.



For additional information write Dept. P.T.J.

JACKSON & CHURCH COMPANY • SAGINAW, MICHIGAN

NEW

NEW from SKF

the HESS-BRIGHT "SY" UNIT PILLOW BLOCK

A new Unit Pillow Block, designed by SKF to meet tomorrow's needs of modern industry.

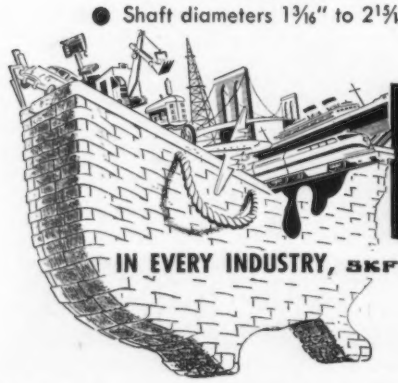
Here are the design features:

- SKF Red Seal, made of DuPont Fairprene, retains lubricant. Wiping action of the seal against the inner ring is practically frictionless.
- Rotating flingers exclude dirt.
- Set screws for ease of installation.
- Spherical outer ring compensates for initial misalignment.
- Alemite fitting for re-lubrication.
- Interchangeability with existing installations made possible by bolt hole spacing and center height features.
- Shaft diameters 1 3/16" to 2 15/16".

Hess-Bright Pillow Blocks

Detailed illustration of rotating flinger and RED SEAL—the extremely light tension contact seal.

From now on, the name to remember in Unit Pillow Blocks is HESS-BRIGHT "SY"—manufactured in our plants, to the same high quality standards as all SKF products. Ask your SKF Distributor to show you the HESS-BRIGHT "SY"; or write SKF direct for complete information on this *newest* Unit Pillow Block.



SKF®
BALL AND ROLLER BEARINGS

IN EVERY INDUSTRY, SKF Puts The Right Bearing In The Right Place

SKF INDUSTRIES, INC., Phila. 32, Pa.—*manufacturers of* **SKF** *and* HESS-BRIGHT *bearings.* 7322-A

NOW! MILL-PROVED FOR PRODUCING LINER BOARD KRAFT!

CHEMI-PULPER®
continuous digester

The mill trials were made in a large kraft mill now using CHEMI-PULPER continuous digesters for producing corrugating board pulp from mixed hardwoods.

Based on a series of trial runs, the operating conditions for the CHEMI-PULPER continuous digester were determined and the operation was placed on a 24-hour basis.

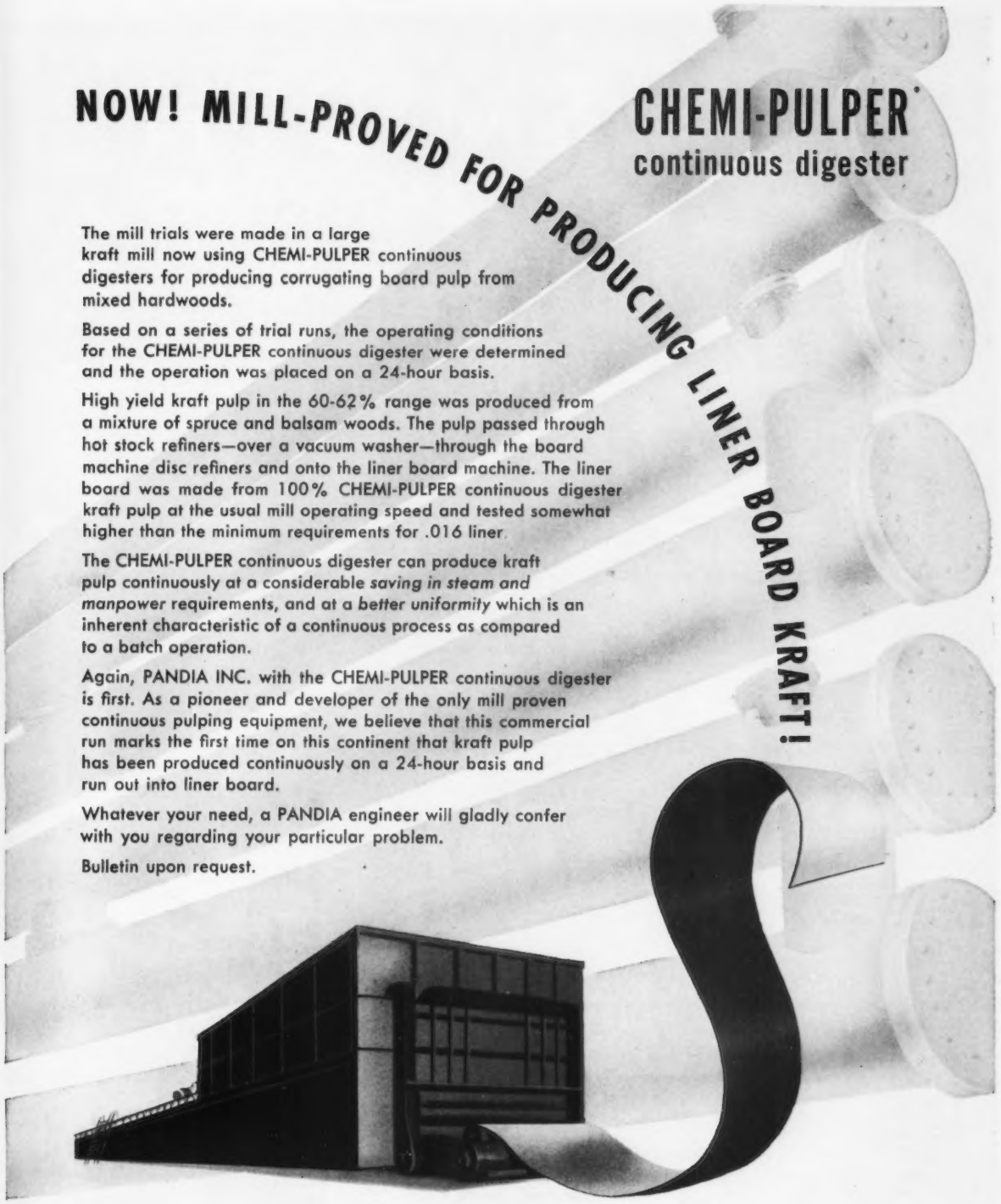
High yield kraft pulp in the 60-62% range was produced from a mixture of spruce and balsam woods. The pulp passed through hot stock refiners—over a vacuum washer—through the board machine disc refiners and onto the liner board machine. The liner board was made from 100% CHEMI-PULPER continuous digester kraft pulp at the usual mill operating speed and tested somewhat higher than the minimum requirements for .016 liner.

The CHEMI-PULPER continuous digester can produce kraft pulp continuously at a considerable *saving in steam and manpower* requirements, and at a *better uniformity* which is an inherent characteristic of a continuous process as compared to a batch operation.

Again, PANDIA INC. with the CHEMI-PULPER continuous digester is first. As a pioneer and developer of the only mill proven continuous pulping equipment, we believe that this commercial run marks the first time on this continent that kraft pulp has been produced continuously on a 24-hour basis and run out into liner board.

Whatever your need, a PANDIA engineer will gladly confer with you regarding your particular problem.

Bulletin upon request.

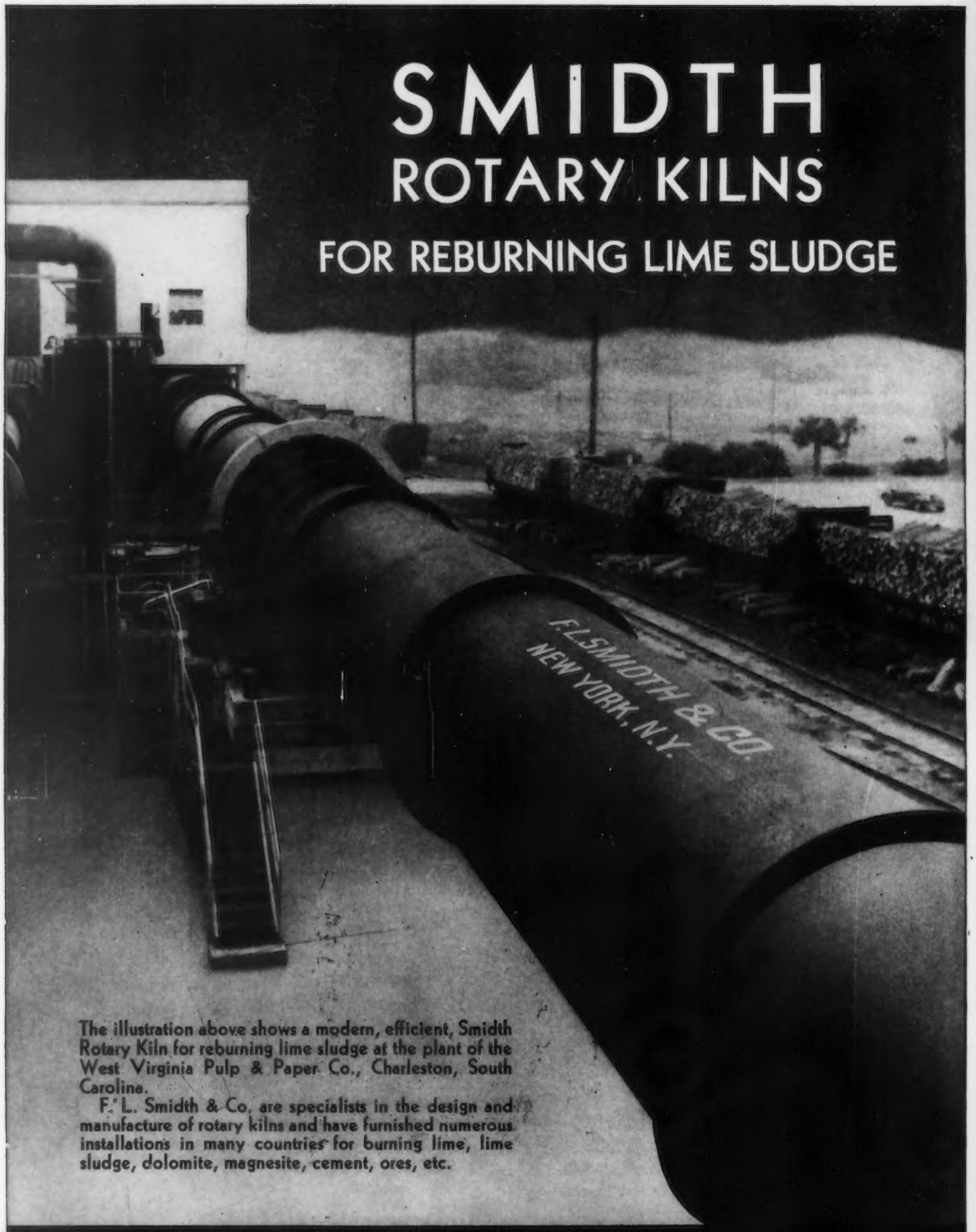


Manufactured and Sold in Canada by
THE ALEXANDER FLECK LIMITED, OTTAWA, CANADA.

PANDIA

PANDIA INC.
122 EAST 42nd STREET • NEW YORK 17, N. Y.

SMIDTH
ROTARY KILNS
FOR REBURNING LIME SLUDGE



The illustration above shows a modern, efficient, Smidth Rotary Kiln for reburning lime sludge at the plant of the West Virginia Pulp & Paper Co., Charleston, South Carolina.

F. L. Smidth & Co. are specialists in the design and manufacture of rotary kilns and have furnished numerous installations in many countries for burning lime, lime sludge, dolomite, magnesite, cement, ores, etc.

F. L. SMIDTH & CO.

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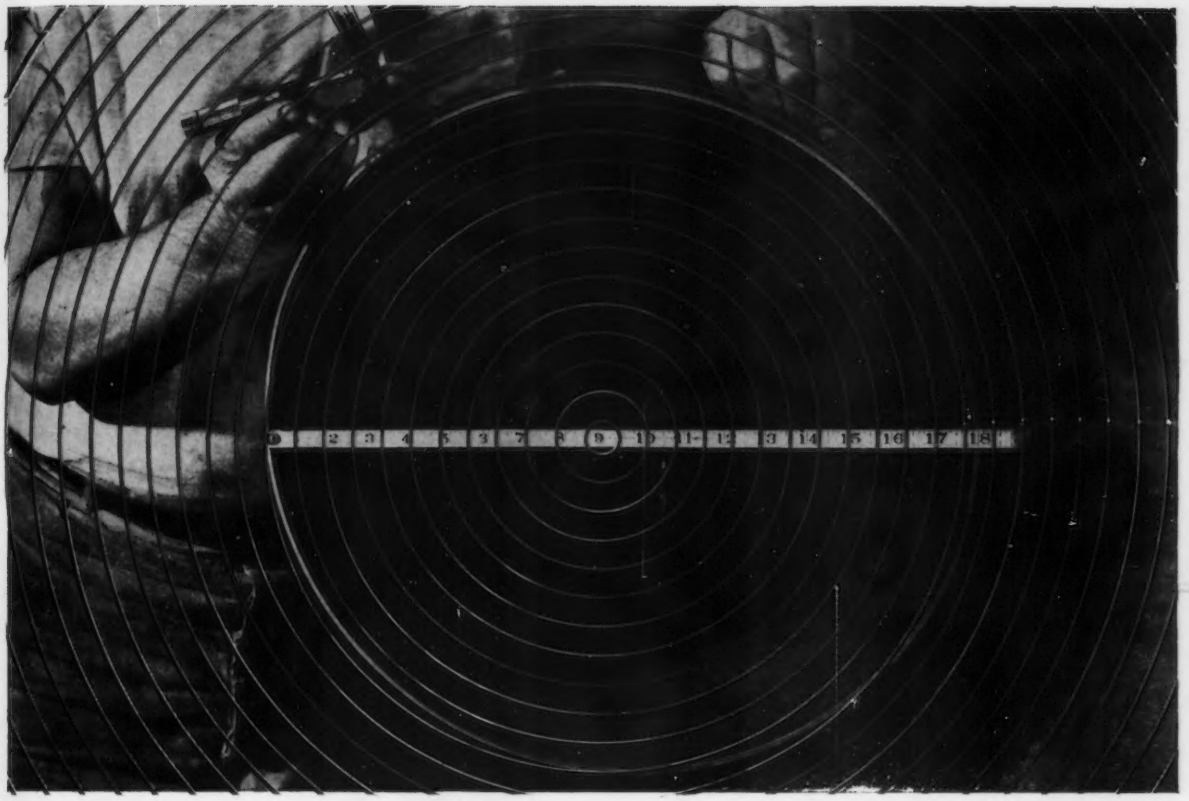


from 1/8" to 40" OD

WHEN YOU NEED STAINLESS STEEL TUBING

TRENTWELD *will meet your needs best*

Name an industrial application that calls for stainless steel tubing — and the tubing to name is TRENTWELD. Available in diameters from ⅛" to 40" OD TRENTWELD presents a broad range of grades, gauges and finishes.

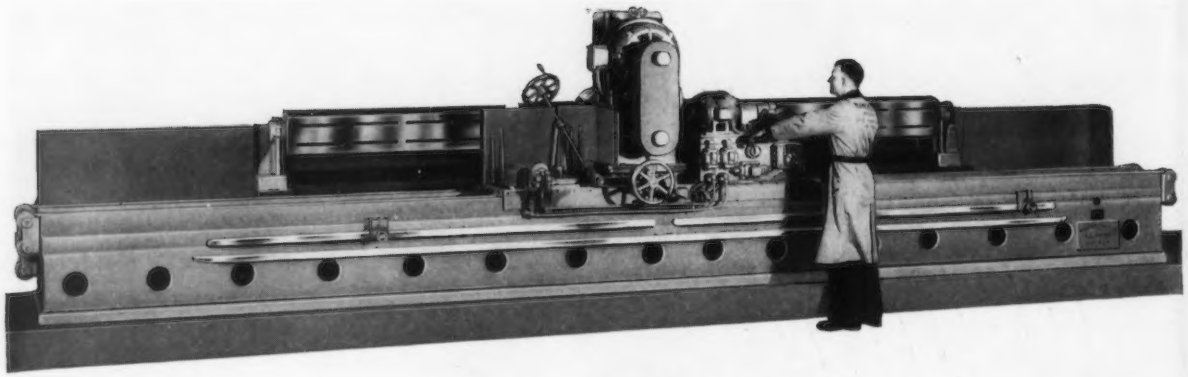
Study the product and the plant where it is produced and you find the reason for the steady increase in TRENTWELD usage. For TRENTWELD is made in a *tube* mill by *tube* experts who roll and weld stainless and high alloy tubing without added rod metal. This Trent method results in metallurgically correct tubing with a uniform section and uniform corrosion resistance.

No matter how specialized your tubing needs may be, you will find there's a TRENTWELD tubing to meet your most exacting requirements. To call in Trent is to put our experience at your disposal. Write us full details of your most pressing problem involving stainless or high alloy tubing.

TRENTWELD

STAINLESS STEEL TUBING

TRENT TUBE COMPANY, GENERAL SALES OFFICES, EAST TROY, WISCONSIN (Subsidiary of CRUCIBLE STEEL COMPANY OF AMERICA)



10' to 100'
SPEEDS—30' to 150' And Faster

MOTORS—7½ H.P. to 40 H.P.
Capacity—84" to 360" and longer.

WEIGHTS—10 Tons up to 40 Tons

This great Hanchett model AK produces high speed grinding with extreme accuracy and efficiency. Grinds FLAT or CONCAVE BEVEL on any desired angle or square. Head carriage travel is free and smooth without shock under all operating conditions. Available with either cylindrical or segmental type wheels. For high speed—accuracy—choose AK!

Mechanical
or hydraulic
head carriage drive
Heavy duty
Massive construction
Accurate - High production
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AK

HANCHETT KNIFE GRINDERS for the PULP and PAPER INDUSTRY

For GRINDING Chipper-Hog-Trimmer-Barker Knives, DOCTOR BLADES & BEDPLATES

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SPEEDS FROM
10 to 80 ft. per minute—
Faster speeds if required
Capacity—32 to 184 inches

Available with either Segmental or Cylinder Type Wheels.

The most complete line of knife and shear blade grinders available today! Proved and improved through years of extensive research, these grinders give precision tolerances and finest finishes under heaviest grinding schedules.

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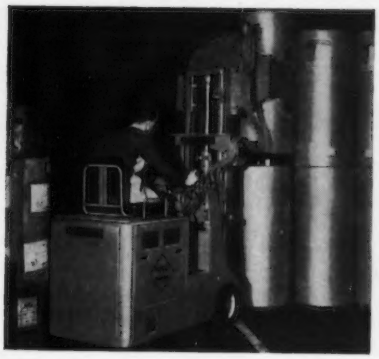
Can You Handle Roll Paper Like This?

With an Elwell-Parker Roll Clamp Truck, you can store ceiling high without pallets or dunnage.

With an Elwell-Parker, you can store rolls absolutely snug because clamp can grip them short-of-center.

With an Elwell-Parker, you can pickup, carry and store the rolls horizontally or vertically.



With an Elwell-Parker and its selective pressures, you can handle many kinds of paper with different winding tensions and diameters.

With an Elwell-Parker and one operator, you can safely handle your rolls far faster than with a whole gang of laborers.

With an Elwell-Parker, you can reduce stock damage to less than ½ of one percent.

Not elsewhere can you get all these benefits because the E-P Roll Clamp Truck has superior functional refinements based upon Elwell-Parker's 30 years' specialization in roll paper handling.

Get ALL the Facts on High-Speed, Low-Cost Handling of Paper Rolls. Send for NEW ILLUSTRATED BULLETIN. Write The Elwell-Parker Electric Co., 4191 St. Clair Avenue, Cleveland 3, Ohio.

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Pressure-Seal Cast Steel Gate Valve

Small Cast Steel Angle and Y-Globe Valves for high-pressure service

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Walworth is proud to be aboard the S. S. United States

When the United States Lines, the Newport News Shipbuilding & Dry Dock Company, and Gibbs & Cox, Inc., naval architects, join forces to build the fastest, safest and most modern liner the world has ever seen, the selected materials and components have to be top quality. Walworth Pressure-Seal Cast Steel Gate, Globe, and Angle Valves, and Walworth Small Cast Steel Angle and Y-Globe Valves for high-pressure service are installed in the main steam lines of the S. S. United States. Brass and copper lines use large numbers of Walseal valves, fittings, strainers, and unions.

Knowing that Walworth valves and fittings are a vital part of the power arteries aboard this great ship, the proudest moment of Walworth's 110 years of manufacturing experience came when the new Queen of the Sea broke both the east and west trans-Atlantic speed records.

As we present our compliments to Commodore Manning and his crew, to the Newport News Shipbuilding & Dry Dock Company and its men, and to William F. Gibbs and his staff, we also compliment the men and women of the Walworth Company who gave of themselves to put quality into our products and this quality ship.

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valves • fittings • pipe wrenches

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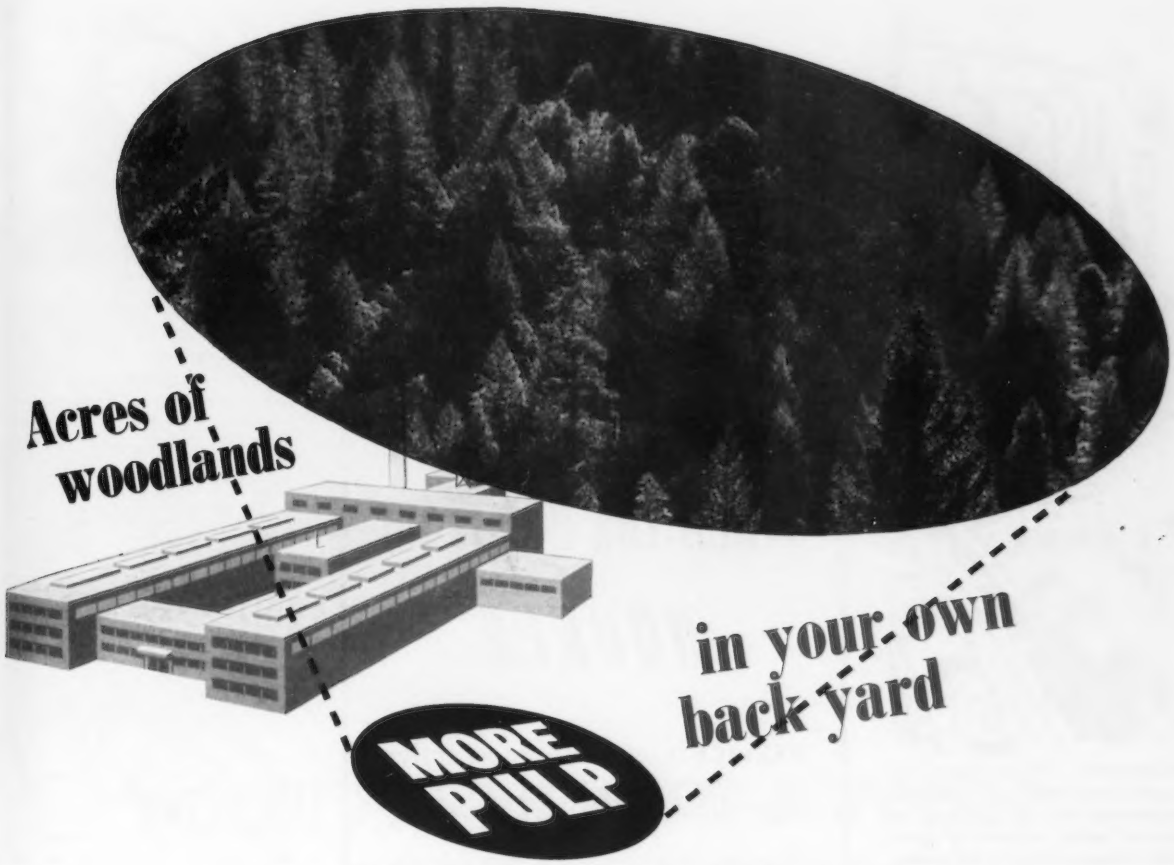


A Sutherland High Yield System* in your pulp mill is like having many thousands of acres of additional woodlands, only better. For, because of higher pulp yield, you not only increase your potential wood supply, but lower your costs, as well. Here's what High Yield did for a kraft mill in the South:

> **By increasing the pulp yield, Sutherland saved approximately 42,000 cords of wood in 1951. Since annual growth in the area averages about one and one-half cords per acre, the saving equals the yearly product of 27,500 acres of woodlands. To this must be added about 330,000 man-hours of labor.**

Increase your reserves of growing timber . . . while reducing your pulp costs. That's *practical* conservation! Write or wire us.

SUTHERLAND

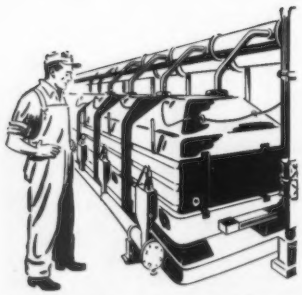
* U. S. Patent No. 2,591,106

Designed, Engineered, Serviced

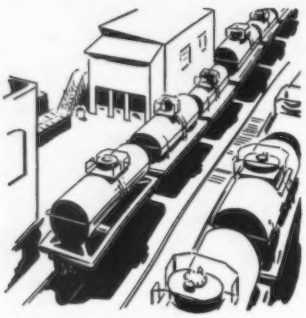
continuous beating systems

by SUTHERLAND REFINER CORPORATION

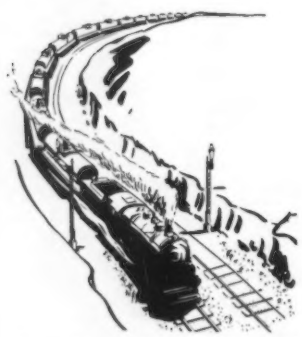
TRENTON 8, N. J.



PURITY . . . From the efficient Hooker "S" Cells we produce chlorine and caustic soda of a uniformity that enables you to keep bleach preparation methods constant, for consistent bleaching results.



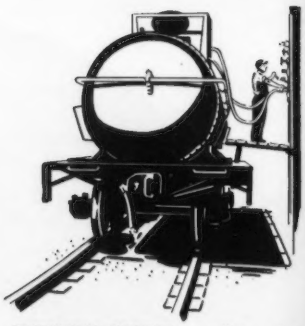
PACKAGING . . . Hooker Chlorine and Caustic Soda are shipped in specially conditioned tank cars, carefully inspected before shipment to guard against leakage and give you trouble-free, safe unloading.



DELIVERY . . . Schedules are planned to meet your production needs. Shipments are checked from point to point en route to insure compliance with delivery schedules.

You Get More than Chemicals When You Buy from *HOOKER*

SERVICE is one of the most active ingredients in Hooker Chemicals. Hooker is a compact, flexible organization of experienced people, geared to serve your needs quickly and competently. Briefly, these are the "added dimensions" that follow the shipment into your plant, helping you make the most of the Hooker Chemicals you buy.



TECHNICAL SERVICE . . . offers assistance on problems of unloading, handling, and processing to enable you to use Hooker Chemicals most efficiently, economically and safely.

MODERN RESEARCH . . . backed by years of experience serving the pulp and paper industries, works constantly to find better ways of producing chlorine and caustic soda for paper making.

SEND FOR THIS HELPFUL DATA ON BLEACHING

BULLETIN NO.

- 201 Process and Equipment for Making Bleach Liquor for Use Without Settling
- 211 Chemistry of Bleaching Chemical Wood Pulps
- 214 What Do We Know About Bleaching?
- 236 Importance of pH and Catalysts in Bleaching Operations
- 242 Production and Use of Unsettled Bleach Liquor
- 243 Procedures and Brightness Grades in Bleaching Sulfate Pulps

From the Salt of the Earth

HOOKER ELECTROCHEMICAL COMPANY

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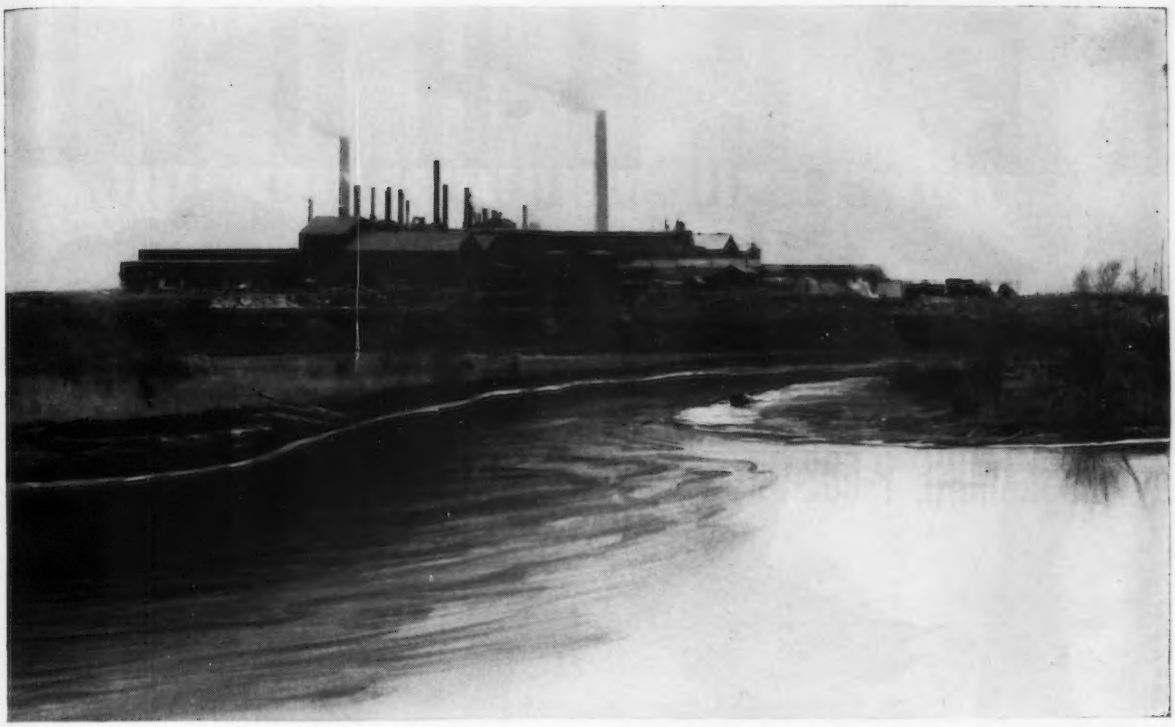
SODIUM SULFIDE • SODIUM SULFHYDRATE • SODIUM BENZOATE • CAUSTIC SODA • MURIATIC ACID • PARADICHLOROBENZENE • CHLORINE



WORRIED ABOUT WASTE DISPOSAL?

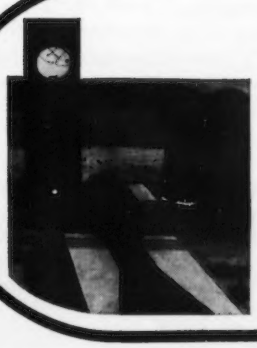
Bailey Meters Help you to Reduce Pollution

● The disposal of industrial wastes without stream pollution calls for careful planning and continuous vigilance.

That's where Bailey Meters and Controls come in. We measure the flow and pH of sewage, sludge, and industrial wastes flowing in open channels or pipe lines. These and other factors, such as levels, rates of chemical feed, and flow of air, may be co-ordinated into a completely automatic system for the treatment and disposal of waste materials.

When you want fast, complete and authoritative answers to the measurement and control aspects of your waste disposal problems, reach for your phone and call your local Bailey Engineer. Offices in all principal industrial centers.

P-24



BAILEY OPEN CHANNEL METERS

These indicating, recording and integrating meters are suitable for measuring industrial wastes, sewage, sludge, corrosive liquids, and irrigation water flowing in all types of open channel primary metering devices, such as Venturi flumes, weirs, or nozzle flumes. Electric or pneumatic telemetering permits location of receivers wherever desired. Ratio of flows and chemical feeds may be controlled automatically.

BAILEY METERS

BAILEY METER COMPANY

1056 IVANHOE ROAD
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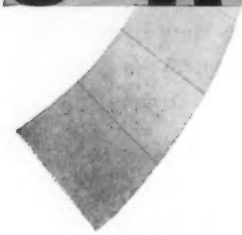
Process Controls

TEMPERATURE · FLOW
PRESSURE · LEVEL
GAS ANALYSIS · RATIO

REICHHOLD

FOR
BETTER ALL-AROUND
WET STRENGTH PAPERS
BECKAMINE P-682-35

CHEMICALS



• Whether you are using bleached or unbleached kraft or sulfite, ground wood, rag, or mixtures of these pulps, BECKAMINE P-682-35 is the ideal wet strength agent. A urea-formaldehyde resin of the cationic type, it can be diluted infinitely with water without precipitation. It is usually applied *after* the refining operation at any convenient point, however, when necessary, it can be added at the beater. The use of resin size, starch or clay does not in any way interfere with its performance. In fact, BECKAMINE P-682-35 aids in the retention of these and other beater additives as well as increasing dry tensile and Mullen strength. For complete information, write for booklet number 300.

See "America's Town Meeting" on TV every Sunday on ABC presented by Reichhold as a public service.

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SYNTHETIC RESINS • CHEMICAL COLORS • PHENOLIC PLASTICS • PHENOL • GLYCERINE
PHTHALIC ANHYDRIDE • MALEIC ANHYDRIDE • SODIUM SULFATE • SODIUM SULFITE

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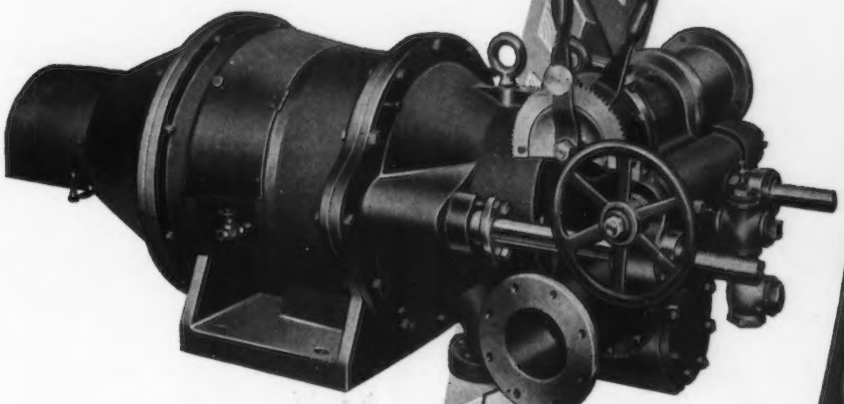
ONE CONTINUOUS OPERATION

COMBINES BEATING and REFINING

SAVES SPACE • POWER • LABOR • MAINTENANCE



MORDEN "STOCK-MAKER"

The "Stock-Maker" combines the best time-proven principles of beating and refining into one compact, versatile and rugged unit, using...

1. **360° of bed plate shell (floating mounted for uniform pressure on all bars) surrounding a beater-roll type of rotor for the most efficient treatment.**
2. **Opposing internal flow pressures seal the stock between the treating elements and hold the fiber on the bar surfaces for complete and uniform treatment.**
3. **Optional internal blending or recirculation of a portion of the fibers for varying the individual fiber treatment on grades where this is advantageous.**

The simplicity, efficiency and advantages of these and other distinctive "Stock-Maker" features are proven by years of mill experience with hundreds of "Stock-Maker" installations on all types of pulps and grades of paper.

May we assist you with your beating and refining? Let us know your requirements.

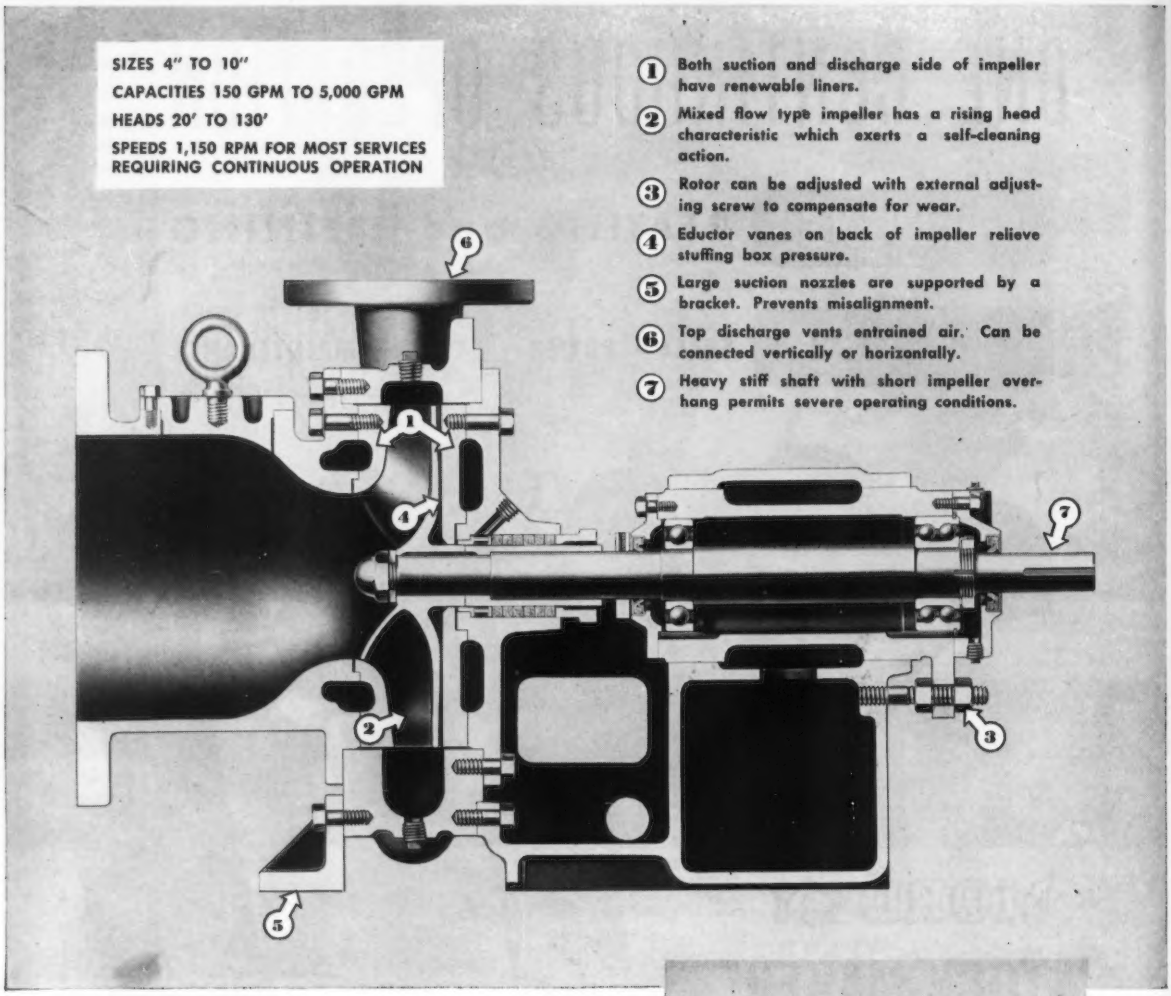
SLUSH-MAKER

MORDEN
Machines Company

STOCK-MAKER

CORBETT BUILDING
PORTLAND 4, OREGON

Simplicity, long life, easy maintenance


SIZES 4" TO 10"
CAPACITIES 150 GPM TO 5,000 GPM
HEADS 20' TO 130'
SPEEDS 1,150 RPM FOR MOST SERVICES REQUIRING CONTINUOUS OPERATION
1 Both suction and discharge side of impeller have renewable liners.
2 Mixed flow type impeller has a rising head characteristic which exerts a self-cleaning action.
3 Rotor can be adjusted with external adjusting screw to compensate for wear.
4 Eductor vanes on back of impeller relieve stuffing box pressure.
5 Large suction nozzles are supported by a bracket. Prevents misalignment.
6 Top discharge vents entrained air. Can be connected vertically or horizontally.
7 Heavy stiff shaft with short impeller overhang permits severe operating conditions.

You get them all with...

DE LAVAL
STOCK PUMPS

Look at the seven outstanding features shown in the cross-section and you'll see why De Laval type CS Stock Pumps stay on the job for years . . . trim maintenance costs. Stock flows freely through a large suction nozzle, an exceptionally large throat area and an unbroken streamlined volute. This minimizes clogging, contributes to high hydraulic efficiencies, lowers inlet velocities, permits the handling of high stock densities with low submergences and prevents de-watering of free stock.

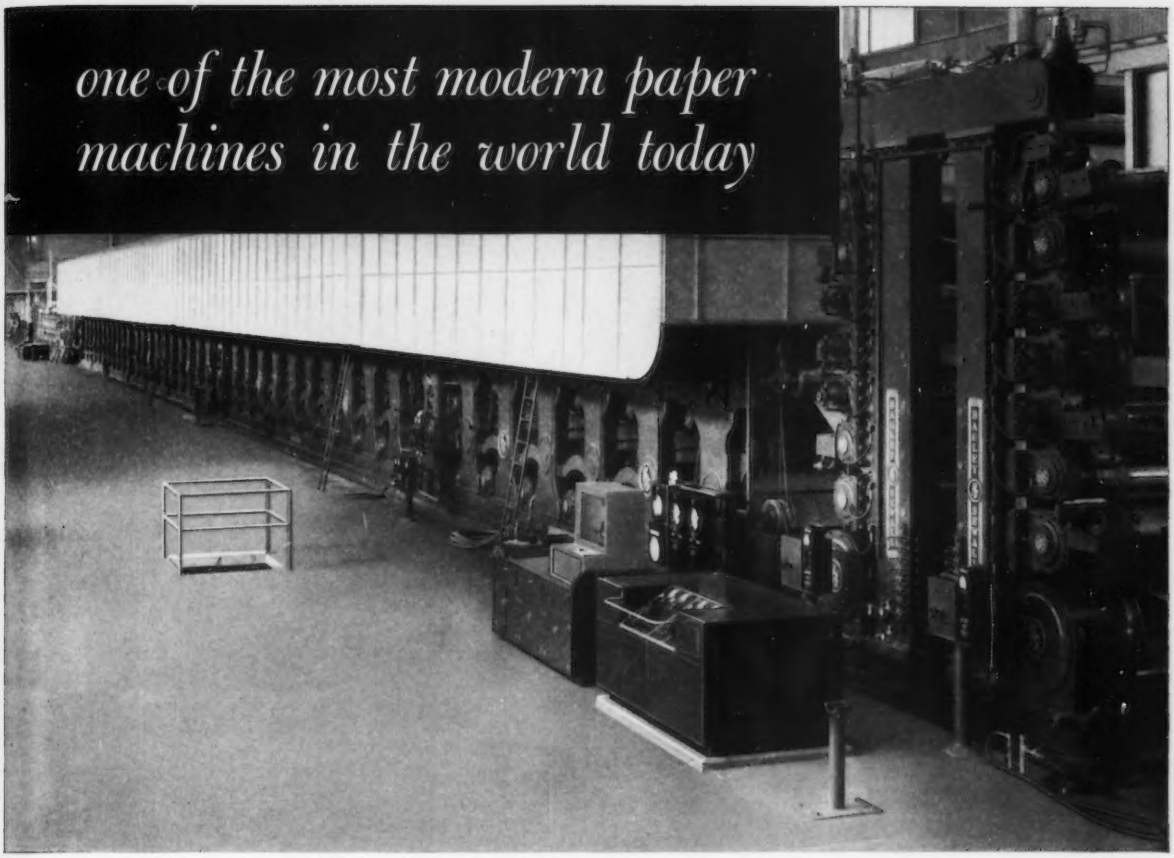
Write today for Bulletin 1100 giving full application and specification data.

DE LAVAL *Stock Pumps*

DE LAVAL STEAM TURBINE COMPANY
812 Nottingham Way, Trenton 2, New Jersey

DL-143

one of the most modern paper machines in the world today



We have designed and built what we believe to be one of the most modern paper machines in the world today. As the modern paper machine has grown in width and speed, it has outgrown mechanical controls . . . but we believe hydraulics is an ideal means of control. This Bagley & Sewall machine is the most completely hydraulic-controlled paper machine in the world. Each major operating unit requiring movement—each pressure operation and control is at finger-tip selection at a station point or console . . . providing instantaneous and accurate operation of the entire machine for the utmost control and productivity.

Recently installed at the St. Regis Paper Company, Cantonment, Florida, this machine has a wire width of 228" and was designed for a production of 400 tons per day at a speed of 2200 feet per minute.

designers and builders of paper making machinery since 1853

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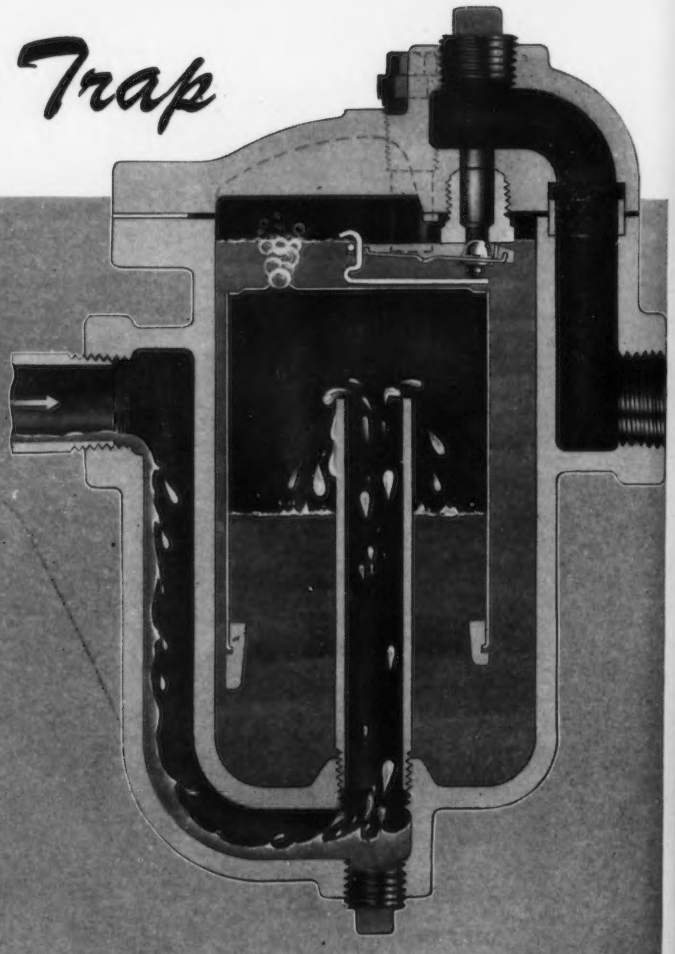
Finland Representative
Aktiebolaget Ekstroms Maskinaffar
Helsingfors, Finland

This Steam Trap



MEETS THE REQUIREMENTS of Paper Machine Drainage

1. FAST VENTING OF AIR

2. LOW MAINTENANCE

STEAM traps haven't always worked so well for draining paper machines. First, they wouldn't vent air fast enough, so that heat-up was slow after the machine had been down. Second, they didn't wear too well.

The Armstrong No. 813D steam trap was designed to answer these objections. That it does has been proved by many mills with individual 813D traps on each dryer.

Large air venting capacity is secured with oversize bucket vents.

Long life with infrequent maintenance has been secured by:

1. An extended inlet tube which admits condensate, steam and air into the trap above the water level in the bucket. This eliminates excessive wear-producing agitation of the mechanism.

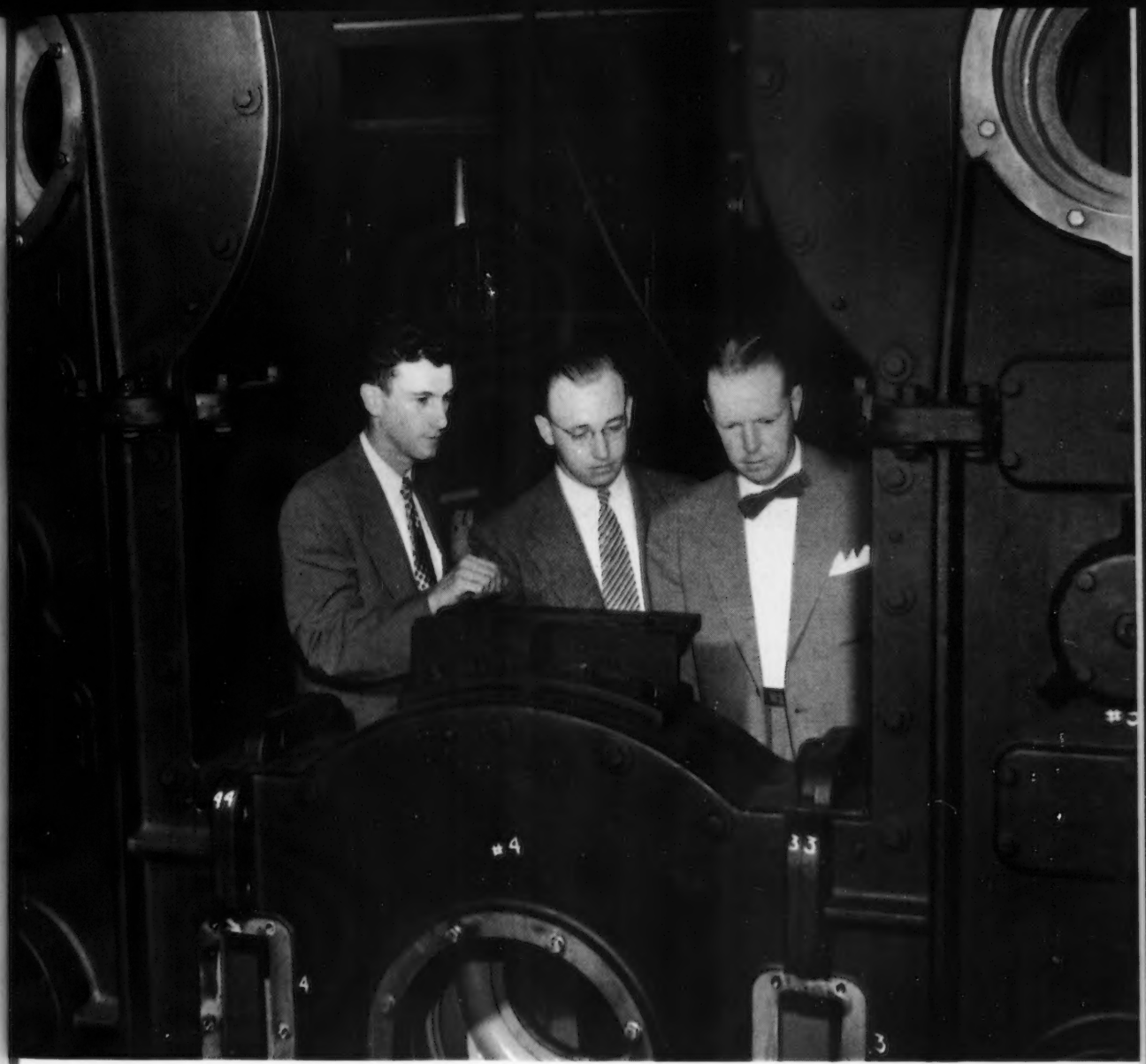
2. Chrome steel valve and seat — hardened, ground and lapped — same as used in traps for 900°F., 950 psig. All other working parts 18-8 stainless steel, heavily reinforced for wear.

With this trap you get all the advantages of simplicity, economy, dependability and fast drainage with none of the previous disadvantages. SEND FOR BULLETIN No. 205.

ARMSTRONG MACHINE WORKS
818 Hoffman Street, Three Rivers, Michigan

ARMSTRONG

Moisture Control Systems
Individual Dryer Temperature Controls
Paper Machine Drainage Traps
Inverted Bucket Steam Traps
Steam Humidifiers



ENCLOSED DRYER DRIVE with gear nips "running in oil" makes possible cleaner, quieter operation at higher speeds. While looking at dryer framework ready to be shipped to a mill on the West Coast, "Bud" Hammill (*left*), E. J. Justus and Sterling Skinner discuss Beloit design features which provide for continuous lubrication and simplified removal of dryer bearings.—*Beloit Iron Works, Beloit, Wisconsin.*

BELOIT

PAPER MACHINERY

WHEN YOU BUY BELOIT... YOU BUY MORE THAN A MACHINE!

Typical wool showroom, where buyers make their selections.

Photographs courtesy of Wool Bureau, Inc.

Out Where Huyck Felts Begin

First, the fleece. From 1,500 classified types, buyers choose only those special wools that meet the exacting requirements of Huyck Felts. In the principal wool-growing countries of the world this discriminating selection goes on. For these must be just certain wools, rare and costly.

In they come, to the great wool warehouses at Rensselaer, New York. From this vast supply, skilled sorters select the grades specified for each type of felt, then blend them for the precise task the felt is to perform on the paper machine.

This is the first, and only the first step in making the famous Huyck felts which for 82 years have rendered such essential service to the pulp and paper industry.

KENWOOD TEXTILE PRODUCTS

HUYCK *Felts*

F. C. Huyck & Sons — *Kenwood Mills* — Rensselaer, N. Y.

We Call it "OUR" Baby!

Our pride in National Gypsum Company's new paper mill at Pryor is something like a doctor's pride in the healthy, husky babies he brings into the world. The parents, National Gypsum Company and its wonderfully co-operative Engineering Department, truly have an offspring they can proudly parade before the industrial world.

Getting down to fundamentals, National Gypsum has . . .

America's most modern paper mill,

Built by Manhattan Construction Company of Muskogee, Okla., erectors of the Southwest's finest buildings and industrial installations. Manhattan built the vast plant and set all the machinery within its walls. The project was

Completed in world's record time for this size plant of only 10 months. Another kind of record was made with start-up time—from pulp to paper in just a trifle more than half an hour!

SKILL · RESPONSIBILITY · INTEGRITY
THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA
A G C

L. Francis Rooney, President
Ray E. Basore, Vice President
and General Manager

MANHATTAN CONSTRUCTION COMPANY

General Contractors

MAIN OFFICE — MANHATTAN BLDG. — MUSKOGEE, OKLA.
OKLAHOMA CITY TULSA FT. SMITH, ARK. HOUSTON

Something to Behold

Above—Shartle-built conveyors are the first operation of a great stock preparation system.

The two on the left feed two batch type H.R. Hydrapulpers—the one on the right a 20′ continuous H.R. Hydrapulper

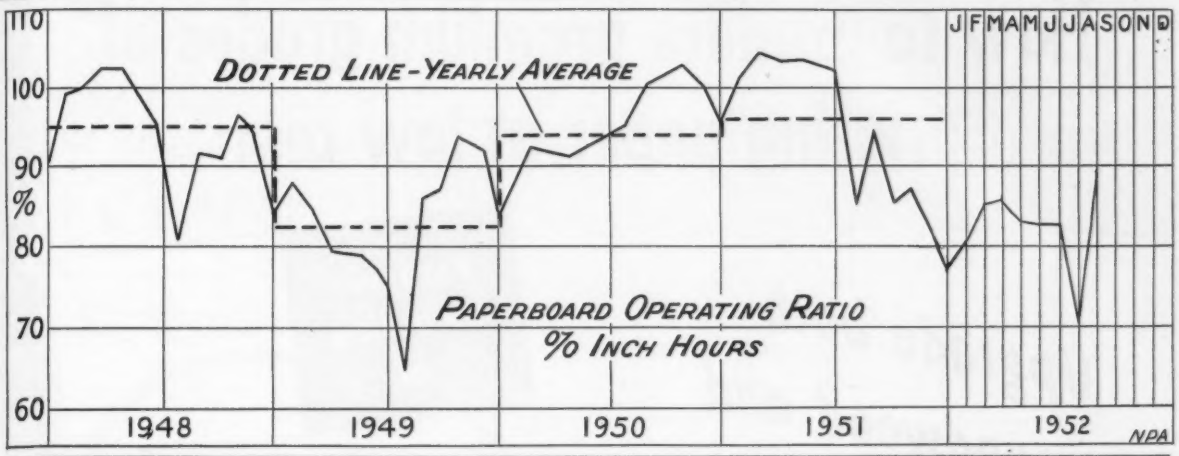
Below—the three H.R. Hydrapulpers extending thru the operating floor and the discharge ends of the three conveyors shown above

If it's stock preparation, it's Shartle the leader, who can serve you best

Photos taken at National Gypsum's new mill at Pryor, Oklahoma

Shartle Bros. Machine Company • Middletown, Ohio

DILTS MACHINE WORKS, Fulton, New York • *Divisions of* THE BLACK-CLAWSON COMPANY, Hamilton, Ohio
Subsidiary: B-C INTERNATIONAL LTD., Greener House, 66/68 Haymarket, London, S. W. 1, England
Associate: THE ALEXANDER FLECK LIMITED, Ottawa, Ontario • *Western Sales Office:* Mayer Bldg., Portland, Oregon
Southern Sales Office: 685 W. Peachtree St., N. E. Atlanta 3, Ga. • *Northern Sales Office:* 814 N. Superior St., Appleton, Wisc.



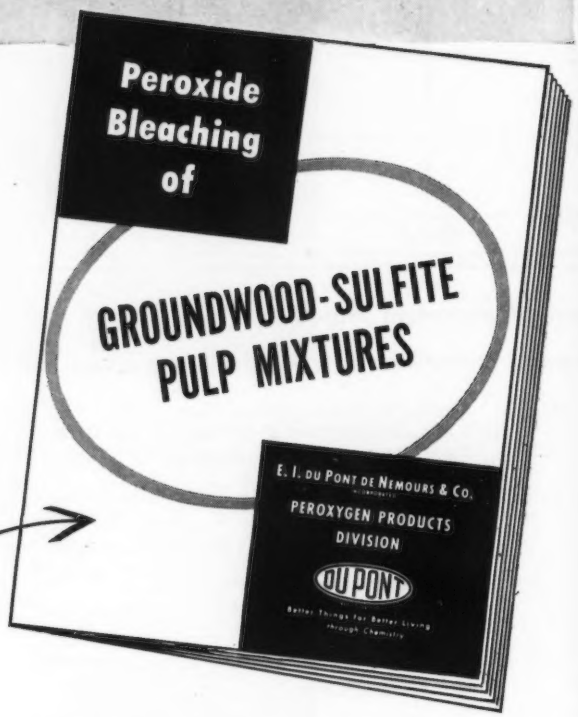
Brief of Important Figures

Source	Production	WEEK ENDING Sept. 6, '52	Aug. 9, '52	Sept. 8, '51
APPA	Paper Production Percent Capacity[3]	64.6	88.1	78.8
	Unbl. Kraft Paper Production Percent	62.3	78.4	79.8
NPA	Paperboard Operating Ratio Percent Inch Hours	72	89	71
		July 1952	**June 1952x**	**July 1951**
APPA	Paper Production* (Except Newsprint and Building Papers) ....Tons	721,500	775,142	808,000
	New Orders ....Tons	756,000	754,869	848,000
	Unfilled Orders ....Tons	733,806	726,029	1,035,765
	Shipments ....Tons	719,000	771,571	796,000
		Aug. 1952	**July 1952[2]**	**Aug. 1951**
NPA	Paperboard Production ....Tons	886,035	871,552	1,112,731
	New Orders ....Tons	832,096	972,183	1,081,321
	Unfilled Orders ....Tons	388,360	444,210	470,841
	Our Customers Activities Index[1]	**Latest Mo.°**	**Previous Mo.°**	**Year Ago°**
FRS	Manufacturers Total Index	214	224	232
	Durable Mfg. Index	249	278	276
	Nondurable Mfg. Index	185	180	197
	Chemical Products Index	294	292	300
	Mfg. Food Products Index	161	154	165
	Printing and Publishing Index	175	174	170
ODC	Magazine Advg.-Printer's Ink Index	362	388	350
	Retail Sales Combined Adjusted Index	393.7	387.7	368.3
	Drug Index	257.0	252.0	247.6
	General Merchandise Group Index	419.0	410.3	388.4
	Grocery and Combination Index	469.2	462.3	440.8
	Prices Index			
BLS	Consumers Price Index[1]	189.6	189.0	185.2
	Wholesale all Commodities[4]	111.3	111.6	115.1
	Wholesale Processed Foods	108.7	108.6	111.3
	Commodities other than Farm Products and Foods[4]	112.6	113.0	116.2
	Wholesale Pulp, Paper[4] and Allied Products	116.7	116.9	120.2
	Purchasing Power of Dollar, Consumers Prices[1]	52.7	52.9	54.0
	General Activity Index			
FRS	Mfg. Production-Worker Payroll[4]	126.2	128.2	129.8
	Unemployment Compensation Initial Claims (M)	987	915	1,118
	Miscellaneous Carloadings–Thousands of Cars	1,298	1,803	1,574
	Electric Output (Million KW hr.)	36,052	37,065	34,966
PTJ	Average 32 P & P Common Stocks as of Sept. 13	$35.20	$36.14	$39.96

[1] 1935–39 = 100 Unadjusted Index.
[2] For Five Weeks.
[3] New 6-7 day basis.
[4] New Index 1947–1949 = 100.
* For details see APPA Monthly Statistical Summary—July 1952 Estimated Figures.
° Latest Month Available on Request.
x Revised Figures.

How to produce premium grades of printing paper at low cost

Upgrade both groundwood and sulfite pulps in one peroxide bleaching operation



Peroxide bleaching of groundwood-sulfite mixtures enables mills to process the entire paper furnish in one bleaching operation . . . reduces capital investment for bleaching equipment and lowers operating costs. Bleached pulps produced with this process feature superior brightness, cleanliness, absorbency and paper machine formation characteristics . . . are ideally suited to the economical production of premium grade printing papers.

COMPLETE INFORMATION on peroxide bleaching of groundwood-sulfite mixtures is available from Du Pont. The coupon below will bring you a new Du Pont book describing the process in detail: economies, equipment used, raw materials required, preparing the bleaching solution, steps in the bleaching operation and chemical control tests. Send for your copy today. You'll find it a valuable source of information for all types of pulp bleaching. E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Dept., Wilmington 98, Delaware.

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PEROXIDES
FOR GROUNDWOOD BLEACHING

AVAILABLE IN DRUMS AND TANK CARS
- "Albone" 35 . . . . . Hydrogen Peroxide, 35%
- "Albone" 50 . . . . . Hydrogen Peroxide, 50%
- "Solozone" . . . . . Sodium Peroxide

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BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

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Please send me my copy of "Peroxide Bleaching of Groundwood-Sulfite Pulp Mixtures."

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Paper TRADE JOURNAL TRENDS

Signs of Returning Health in Wood Pulp Market

From the early announcements of fourth-quarter pulp prices, there are signs of returning health in the wood pulp market. With a little more encouragement from business improvement, and the expressed desire of consuming mills to build market stability from current levels, it now appears that fourth-quarter prices will be only slightly adjusted from the third, that some firming could eventuate before the close of the year.

Evident up to press time was the growing market's sanity about the current price level, which is generally held to be too close to the breakeven point for healthy business. Rather than allow the price to dip to unprofitable levels by pressure from competition, producing mills are inclined to cut production back further.

U. S. Demand Has Improved

Two important factors in the market are: (1) demand from U.S. consuming mills has improved. Tissue mills have shown a noticeable pickup, for example. Board mills are, at latest report, running ahead of 1951's week in both production and new orders. (2) A related factor is that consumers express a desire to see pulp prices stabilize. They do not wish to see develop a price-cutting competition that, in turn, will hit the paper market structure.

What cannot be overlooked, however, is the stock position at consuming mills. In the case of unbleached sulfites and unbleached krafts, these inventories are of troublesome size. With improvement in demand from board mills, the kraft position could improve quickly. Brighter outlook for tissues will reduce unbleached sulfite stocks. However,, in view of the sizable stocks of this latter grade in Canada and in Scandinavia, there is prevalent a belief that some adjustment must be made in the price of the Canadian unbleached sulfites of the news grades.

Fourth Quarter Indications

Bleached Sulfites.—U.S.: $140, delivered, price unchanged. Norwegian: $140, delivered. Change from on dock basis amounts to about $10 to midwestern mills. Canadian: Probably $140 deld. Little change expected, however.

Bleached Krafts.—U.S.: $145, deld., dip of $5. Canadian: $145, deld., down $5. Also announced $155, price unchanged. Scandinavian: no word.

Unbleached Sulfates:—No announcement from Canadian mills likely before the 25th. Swedish: two mills, $115, OD.

Unbleached Krafts:—Canadian: $100, (one mill); unchanged.

Scramble for Mixed Paper in New York Market

The return of another strikebound board mill to production during the last 10 days has added pressure to the supply of low grades in the New York market. Particularly is this true of *mixed.*

A glut of mountainous proportions for several months; burned or practically given away in order to keep the flow of contract tonnage moving from industrial buildings; it is now being sought in a volume that is not available. The result is a scramble for stock and a confused price picture.

The price range reported here is $7 f.o.b. cars New York for leading New Jersey board mills; and $10 for other volume contract tonnage.

Though dealers had expected the $7 price to be lifted, there currently appears to be no bent in that direction. Reported as evidence of the confused picture is that of a mill buying at $7 while the dealer associated with the board mill asks $10 for his *mixed paper.*

Since the cost of handling *mixed paper* is close to the $7 figure, this price is being artificially held at a low that is unhealthy for the market's small consumers.

News and old corrugated are strong at today's prices of $15 and $17 respectively, f.o.b. cars.

Tab cards show particular strength at $75/85 for manilas, and $55/65 for colors, with some higher levels reported for bale pack. Ledgers are strong at $60/65 for whites, $45/50 for colored. Hard white envelopes show no weakness at $120/130. Spot tonnages move at somewhat higher figures for all grades.

Double kraft lined cuts and 100 percent corrugated are firmer. A low of $35 on the former erases the weakness from this grade. Quoted by one dealer is $45, though substantial tonnage in this area is moving to mills at $37.50, at $40/45 in other markets. Demand is showing definite strength, it is reported.

Materials

Potato Starch.—New crop price for the Idaho product has been named at 8½ cents, carlot works. Table yield is rated unusually high with a relatively small amount of culls. Strong competition for the culls is coming from dehydrators, so that little volume will probably be made into starch. Price is therefore strong at this level.

Dutch product is priced at same range as Danish: $8.70 per hundred pounds, in gunny bags, $8.75 in paper bags, ex dock, duty paid.

—E.P.N.

TABLE I

Woodpulp: U. S. Production, Consumption, Inventories, July 1952

(Tons of 2,000 pounds)

Grade	U. S. Production	% of Base	Consumption in paper & bd. manuf.	Inventories at paper & bd. mills		
				July 1952	June 1952	July 1951
Total	1,192,205	70.1	1,258,749	541,368	551,902	482,797
Spec. Alpha & Dissolving	54,475	76.9	3,704	17,266	18,422	9,038
Sulfite, Total	157,629	62.2	206,918	225,570	231,115	189,228
Blchd. total	110,991		131,625	116,809	119,037	80,254
Unblchd.	46,638		75,293	108,761	112,078	108,974
Sulfate, Total	613,677	72.1	655,170	243,269	242,520	205,155
Blchd. total	156,914		186,415	151,161	148,531	98,156
Semi-blchd.	20,596		23,023	9,779	9,855	8,858
Unblchd.	436,167		445,732	82,329	84,134	98,14 1
Soda	27,172	49.1	30,000	15,761	16,030	11,852
Groundwood	187,689	72.7	210,694	32,112	36,053	58,723
All Others	151,383	71.4	152,263	7,390	7,732	8,801

Based on Bureau of Census figures. * Revised.

Paperboard Production (Tons)*

	Sept. 6 1952	Aug. 30 1952	Sept. 8 1951
Production	175,730	224,724	161,170
New Orders	269,531	216,985	262,017
Unfilled Orders	480,274	388,360	566,141
% of Activity	72	90	71

* Source: National Paperboard Assn.

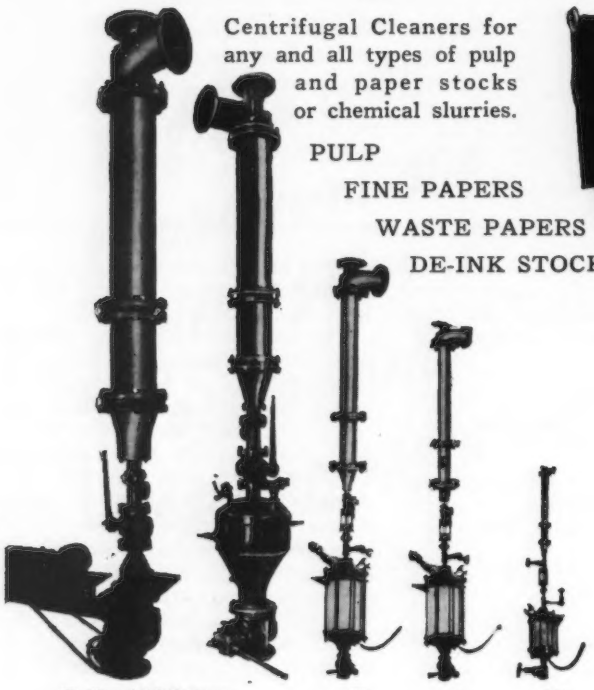
NICHOLS EQUIPMENT FOR THE PAPER INDUSTRY

Stock Cleaning Equipment • Flash and Multiple Hearth Pyrite Roasters
Bark Burners and Special Furnaces

VORTRAPS

Centrifugal Cleaners for any and all types of pulp and paper stocks or chemical slurries.

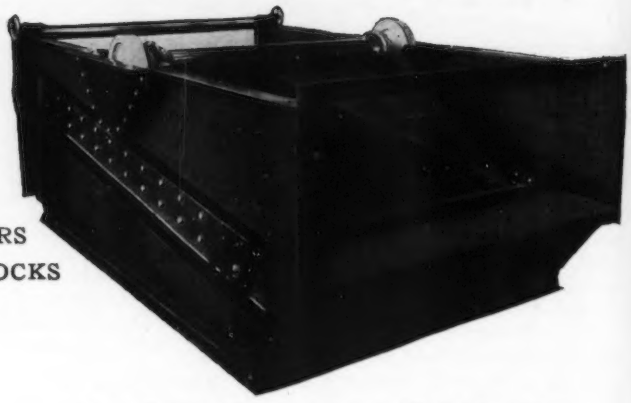
PULP
FINE PAPERS
WASTE PAPERS
DE-INK STOCKS



6", 8" and 10" Vortraps With Automatic Rejects Valve or Waste Receiver — 4" Vortrap — 3" Vortrap — 1½" Vortrap

THE REENER SCREEN

Vibratory Type • Low Head • Highly Efficient



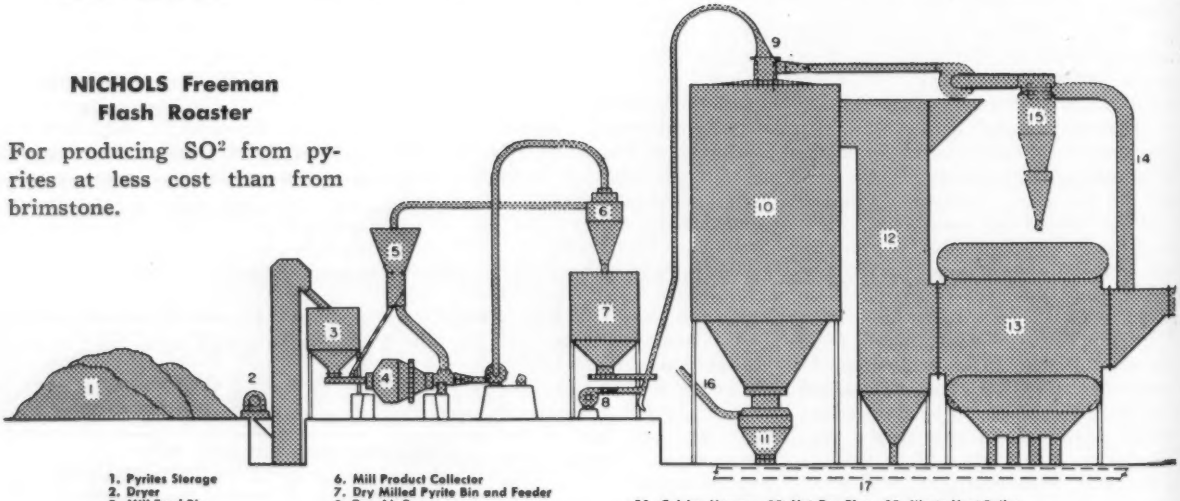
Low Power Consumption • High Capacity
Low Maintenance Thru Rubber Mounting

NICHOLS MONOHEARTH BARK BURNING FURNACE

High moisture content barks disposed of with high heat release. Can be applied to new or existing boilers.

NICHOLS Freeman Flash Roaster

For producing SO^2 from pyrites at less cost than from brimstone.



1. Pyrites Storage
2. Dryer
3. Mill Feed Bin
4. Ball Mill
5. Classifier
6. Mill Product Collector
7. Dry Milled Pyrite Bin and Feeder
8. Top Air Fan
9. Air-Pyrites Pipe and Burner
10. Nichols Freeman Flash Roaster
11. Calcine Hopper
12. Hot Gas Flue
13. Waste Heat Boiler
14. Recycled Gas Line
15. Dust Collector
16. Bottom Air Inlet
17. Calcine Conveyor

NICHOLS ENGINEERING & RESEARCH CORP.

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Canada's Labor Costs Increase

OTTAWA — Canadian Government's nationwide survey of the paper products manufacturing industry has just revealed an increase in the number of employes engaged in such operations as well as a continuing trend of steadily rising costs for labor despite all efforts to keep down production costs in other directions.

This latest survey discloses that there were 76,081 employes in this industry about the middle of the year, June 1, although a month earlier, May 1, such employes numbered only 75,452 and at April 1 numbered 74,855. Obviously, there is a trend to increase the number of employes wherever it is possible to speed up production and help efficiency of operations.

Moreover, this report indicates that the average weekly salaries and wages of these employes are continuing to increase, rising to $65.57 at June 1 this year as against $65.52 at May 1 and $61.74 at June 1 last year, with the wage-earners numbering 65,805 at June 1 this year as against 64,699 at May 1 and their weekly wages rising to $63.05 at June 1 against $62.91 at May 1 and $59.87 at June 1 a year ago.

The average hourly earnings of such workers remained at 142 cents at June 1 as at May 1 but this was far above the 128.2 at June 1 last year, with the average hours per week being reported at 44.4, 44.3, and 46.7 on these respective dates. In addition, the index on employment shows an increase to 184.4 at June 1 in contrast to 182.9 at May 1 and 184.5 at June 1 a year ago, with payrolls standing at 450.0, 446.1 and 423.9 respectively on these dates, based on 1939 being 100.

Of the 76,081 employes reported at June 1 this year, men comprised 66,261 and women 9,820, or 87.1 percent and 12.9 percent, whereas a year ago on the same date men comprised 86.1 percent and women 13.9 percent.

Pulp and paper mills throughout Canada also witnessed an impressive increase in number of employes reported at June 1 this year, these rising to a total of 54,943 as against 54,428 at May 1 and 53,709 at April 1. Their average weekly salaries and wages advanced to $70.66 at June 1 compared with $68.12 on same date last year, with 48,252 wageearners being reported at May 1 but 49,957 at June 1 and their average weekly wages being up at June 1 to $67.95 in contrast to $66.16 a year ago. The average hourly earnings in the mills amounted to 150 cents at June 1, whereas on this date last year it was 136.7 cents. The average hours per week was 45.3 at June 1 compared with 45.5 at May 1 and 48.4 at June 1 a year ago.

Employment in the pulp and paper mills moved up to 179.3 at June 1 compared with 177.7 at May 1 and 174.8 at June 1 last year, with payrolls standing at 448.0, 447.3 and 421.2 respectively, based on 1939 being 100. There has been only a slight change in the proportion of male and female workers in these mills since at June 1 this year, of the 54,943 employes, 52,208 were men and 2,735 women or 95 percent and 5 percent, whereas last year on this date men comprised 95.1 percent and women 4.9 percent.

Manufacturers of other paper products, such as paper boxes and bags, roofing papers, and miscellaneous paper products, also reported a gain in the number of their employes, these rising to 21,138 at June 1 compared with 21,024 at May 1 but below the 21,146 at April 1. The average weekly salaries and wages in these operations continued to advance, rising to $52.35 at June 1 compared with $50.87 at May 1 and $46.54 at June 1 last year, with 15,848 wage-earners being reported at June 1 compared with 21,024 at May 1 and their average weekly wages moving up to $47.39 at June 1 as against $45.60 at May 1 and $42.03 at June 1 a year ago.

The average hourly earnings in such operations reflected a further rise in costs since it amounted to 114.2 cents at June 1 compared with 112.6 cents at May 1 and 100.3 cents at June 1 a year ago, average hours per week standing at 41.5, 40.5 and 41.9 respectively on these dates.

There was a slight gain in employment in such operations, rising to 198.9 at June 1 compared with 197.8 at May 1 but still below the 212.2 at June 1 last year, based on 1939 being 100, with payrolls moving up to 457.1 at June 1 against 441.8 at May 1 and 433.7 at June 1 last year. Slightly less number of men were employed since at June 1 this year, of the 21,138 employes, men comprised 14,053 or 66.5 percent and women 7,085 or 35.5 percent, whereas a year ago on this same date men made up 64.8 percent and women 35.2 percent.

It is apparent from this latest nationwide survey that costs of labor are continuing to rise in the pulp and paper industry, with operators endeavoring to increase their output as well as improve their efficiency.

Urges Move To Rescue Canadian Forests

MONTREAL — That the forests of Canada will always be the pacemaker of national prosperity was pointed out in a public message by John Bassett, publisher of the *Montreal Gazette*, and a former president of the Canadian Forestry Association.

"Forest industry, now the largest employer of labor and the chief pillar of our trade with the U. S., should be maintained permanently in that position through zealous husbanding of the forest resources," Mr. Bassett said.

In a real sense the continuity of Canada's forest treasure is an automatic governor of all industrial development. No dramatic expansion of oil wells or base metals can compensate for depletion of the country's woodlands. It seems, therefore, a grim reflection upon Canadian shrewdness that we should tolerate 3,500 annual forest fires set wholly by human negligence.

"Authorities claim that this nation pays a yearly penalty of two million acres of devastated countryside, and 400,000 acres of young forest growth. This surely is contrary to what most Canadians would prescribe for their richest national heritage, next to agriculture, but it goes on from year to year. Some means must be found, and that shortly, whereby the woodland endowment is rescued from fire waste and turned to full account for the upkeep of industry and employment."

PEOPLE

D. H. KENNEDY has been named Western sales manager of International Paper Co., Southern Kraft Div., succeeding the late **Raymond Bee.**

Mr. Kennedy joined International at the Camden (Ark.) Mill in 1936. He transferred to the Sales Department in the Chicago Office in 1938 and in 1948 was appointed assistant to the western sales manager for the Southern Kraft Div.

J. D. Dooley has been appointed assistant western sales manager — kraft linerboard sales, and **N. P. Sparkman** assistant western sales manager — kraft paper and bag sales.

KARL A. CLAUSON, former secretary, Association of Pulp Consumers, has been elected vice-president of Parsons Whittemore Co., pulp and paper importers and exporters.

RICHARD A. McDONALD has been appointed Administrator of N.P.A. by Secretary Sawyer, to succeed H. N. Fowler. Mr. McDonald is on leave from Crown Zellerbach Corp., where he is the chairman of the Executive Committee.

M. H. COLLET, formerly assistant to W. J. Bailey, vice president, has been assigned by the Wood and Woodlands Departments of West Virginia Pulp and Paper Co. to explore opportunities in Latin America. Duties formerly handled by Mr. Collet will be divided between **D. Y. Lenhart,** who has been assistant manager of the company's Southern Woodlands Office in Summerville, S. C., and **P. T. Lannan, Jr.,** manager of the company's Westvaco Experimental Forest, near Andrews, S. C.

Mr. Lenhart is appointed general manager of woodlands for the company, with headquarters in the New York office. He has been assigned responsibilities formerly held by Mr. Collet with regard to management activities on company lands and the general pulpwood supply for company mills.

Mr. Lannan is appointed technical advisor to the vice-president. In this capacity he will administer the Southern, Appalachian and Northeastern forestry and pulpwood research projects of the company. He will divide his time between his present Westvaco Experimental Forest headquarters and the company's New York office.

NORMAN J. STEIN has been appointed general manager of the American Tissue Mills, Holyoke, Mass. For the past few months, Mr. Stein has supervised the installation of extensive new equipment in both of the company's two paper mills in South Hadley and in the Holyoke converting plants. The company can now manufacture special industrial tissues and light weight krafts and sulphites to customers' specifications as a supplement to the established products made for the past three generations. Mr. Stein was formerly associated with the Merrimac Paper Co., Inc. of Lawrence, Mass. as vice-president and general mill manager. Further modernization of plants and equipment will proceed as rapidly as possible.

JOHN M. HAYWARD has been named assistant general manager of Kalamazoo Label Co., Kalamazoo, Mich. Mr. Hayward is the son of the late Ralph A. Hayward for many years president of Kalamazoo Vegetable Parchment Co. Since the war, and prior to joining the Kalamazoo Label organization, John Hayward was engaged in planning and production control at Kalamazoo Vegetable Parchment.

JOHN FERGUSON, who has been at the Sorg Paper Co. mill in Middletown, Ohio, has been assigned as sales representative for the southeastern territory and will operate out of his headquarters in Atlanta, Ga.

Richard A. Broeren has been transferred from the southeastern territory, where he has been representing the company, to the Sorg New York office. He will represent the company on merchants products in both the New York City and New York State markets.

G. W. (Cap) HEITZ has retired as vice-president of Western Tablet & Stationery Corp., Dayton, Ohio. Mr. Heitz has occupied the position he is now leaving since 1927 and prior to that time served in various capacities and in several companies within the Paper Stationery and Tablet Industry. While Mr. Heitz has resigned as an officer of Western Tablet & Stationery Corp., in order to allow him more leisure time in the future, he will continue to serve the corporation in an advisory capacity.

WILLIAM P. HICKS has been appointed vice-president — General Sales Division of Gaylord Container Corp.

Mr. Hicks has been associated with Gaylord since 1937, the year in which the corporation was organized, and has been assistant to Joseph M. Arndt, vice-president—Director of Sales.

ERNEST NUSPLIGER has been appointed, effective September 1, executive vice-president and general manager of The J. P. Lewis Co., manufacturer of specialty boards, located at Beaver Falls, N. Y. Mr. Nuspliger has been connected with the company for forty-three years and formerly served as mill manager of the company.

EDWARD LUM, chemist and safety director, left Beckett Paper Co., Hamilton, Ohio, to return to Hawaii. **Thomas Friedrich** was engaged as chemist. **Robert H. Zecher** was promoted from the Cost Department to the office of Purchasing Agent replacing **Charles J. Pflomzer** who died July 26.

C. LONGFORD FELSKE, Chicago, has been named vice-president in charge of finance of Kalamazoo Vegetable Parchment Co. He will begin his new duties Oct. 15. For the last 16 years he has been associated with Morris, Hall & Co., Chicago, lately as a vice-president.

GEORGE W. deSMET, manufacturers' agent, and **J. C. Hankey,** packaging and paper specialties, 185 Devonshire Street, Boston 10, Mass., has been appointed representatives to cover the New England area for Shelton Manufacturing Co., Inc., Newark, N. J.

JOHN TRIMBLE has been promoted to paper machine superintendent of the Crystal Tissue Co. In his new job he is responsible for the operation of the four paper machines. Mr. Trimble has been with Crystal for 30 years and started as machine tender in the old paper mill.

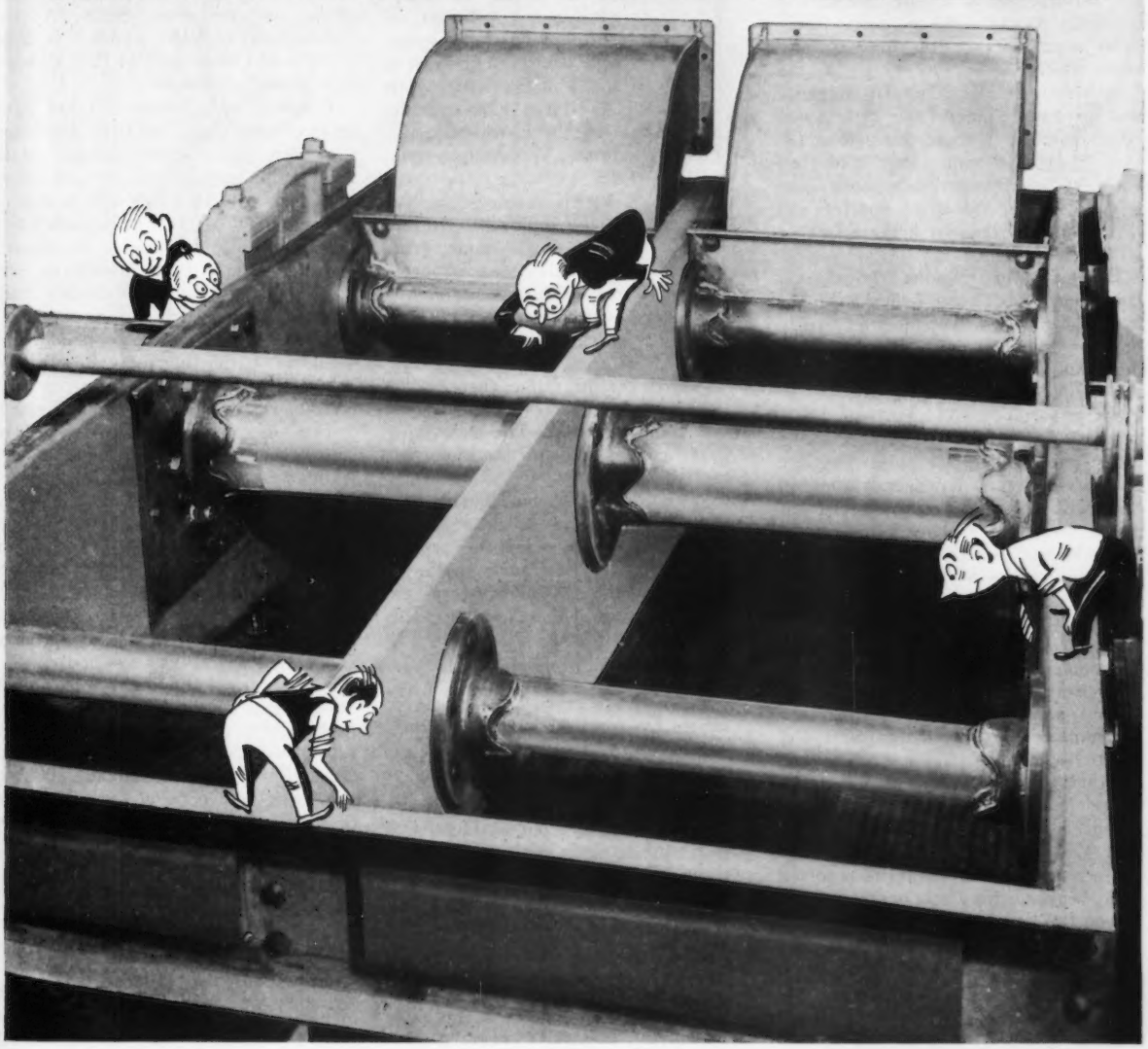
Joe Blashock was promoted to tour foreman. He started working in paper mills when he was 17 years old. In 1928, he came to Middletown and Crystal and has been with the company for more than 24 years. He also started as a machine tender.

Steel Freeze Halts Mill Work

Government imposed civilian steel freeze has caused temporary halt in construction work for the new Marinette (Michigan) Paper Co., converting plant at the Park mill.

Other phases of construction such as work on the parking lot, relocating the highway and moving of power and telephone lines is underway and the construction crew is in readiness for work as soon as steel is released for the building, company officials said.

LOOK INTO THIS BIRD JONSSON SCREEN



as a knotter or tailings screen handles sulphite up to 1½% consistency, 80 to 100 tons per day — sulphite or groundwood up to 2½%, 150 tons per day.

ahead of brown stock washers delivers stock free of knots, shives, and chips — increases washing efficiency, assures maximum black liquor recovery.

as a fine screen equipped with slotted plates it provides high efficiency and high capacity at low screening cost per ton.

on old paper stocks screens out paper clips, rubber bands, cellophane, string, wet strength paper, etc. with almost no loss of good fibres. Operates for as little as 0.06HP per ton.

See for yourself what the Jonsson Screen can do. Trial runs can readily be arranged.

BIRD MACHINE COMPANY

SOUTH WALPOLE • MASSACHUSETTS

EUROPEAN SPOTLIGHT

During the depression of the last months, there always was the feeling that in the Autumn conditions might get better. But now that Autumn is arriving, papermakers in some European countries are no longer quite sure about better business in the fourth quarter. Especially in England and in France there are little signs which indicate a more prosperous future, though in some other countries, such as the Netherlands, conditions were better in the third quarter and the fourth quarter may bring a further stiffening of demand.

Especially in *England* the market continues to be quiet. The hope for better business in September proved to be, for many papermakers, a false hope, and it is generally accepted that the Autumn pickup will not be of great importance. Nevertheless, latest reports show a slightly greater interest of papermakers for pulp. Tonnage contracted for is, however, rather on the small side, and the feeling is that prices may have reached bottom now.

Newspaper publishers may be happy with the results of their negotiations with newsprint suppliers — price of newsprint went down for the home market from £64 to £56 per long ton. To compare: Before the war, the price was about £10! At the same time, newspapers got permission to increase the number of their daily pages and the well-known magazine *Picture-Post* returned to its old price of 4 pennies, which had been raised to 6 pennies because of high paper prices about a year ago.

Much the same situation is reported from *France*, where economists in vain are on the lookout for the fall revival. Illustrative of conditions here is the total collapse of the wastepaper market. Home producers of woodpulp follow with keen interest the development of the strawpulp industry in France, which has an ever growing importance and which is backed by the simple fact that France lacks dollars (U. S. and Canadian) to buy enough pulpwood.

Nevertheless, the Government has made available necessary dollars for buying about 100,000 cords of pulpwood from Canada. It may be known that this quantity is not sufficient, as is shown in the following simple statement: Paper and board production in France is about 1½ million metric tons —a figure which entitles France to the third place among the European paper producing countries. Woodpulp output, however, is not as large, just over 500,000 tons, which involves the use of 550,000 cords of pulpwood. Before the war, 330,000 cords came from France, the remainder was imported from Russia and Finland. After the war, France was able to fill the gap left by Russia by cutting rights in Germany, but these have ceased late in 1950. In the meantime, there is less wood available in France — maybe about 260,000 cords. The remaining 290,000 cords have to be imported; potential supplies seem to be some 100,000 cords each from Canada and Finland. There is a deficit of 90,000 cords but illustrative for the present conditions is that France thinks it will not need these 90,000 cords, as the diminishment of demand will fill this gap.

Uncertain conditions prevail in *Germany*, where the woodpulp industry was the first to undergo the bad results of this depression, as already in the month of May the amount of new orders received cut back more than 25 percent. The paper industry got its difficulties only one month later, and had a hard struggle with severe competition of Austrian, Belgian and Dutch paper producers. These countries offered their paper even below Scan-prices. In the month of June, the pulp industry had a production of only 32,800 metric tons, lowest since 1950. The same situation applies to mechanical woodpulp and waste paper. Nevertheless, consumption figures for the last months indicate that consumption is higher than production, which proves that large stocks are coming into circulation. August and the first week of September show the same situation without important Autumn revival.

Whereas *Belgium* only reports that no better conditions are coming into existence, we receive from *Holland* a report of the biggest paper and pulp producers, Van Gelder Zonen, stating that all machines are working again in the third quarter and that sufficient orders for the fourth quarter are on hand. Though this year the top production of 1951 will not be reached, it is thought that 1952 also will give satisfactory results. The same conditions may apply to the whole of the Dutch paper industry. Holland seems to be one of the few countries where really some Autumn pickup is shown.

Italy is no exception to the general and unchanging rule. Mention is made of a new company, S.p.A. Artiere Giovacchino Checchi, which is to build a paper and board mill at Pietrabruona near Prescia-Toscane.

Formerly, *Jugoslavia* did not have an important paper industry. But some time ago, this country commenced to make sulphite pulp in a mill at Prijedor. It is said that this mill is able to meet demand of the home market and that even pulp is available for export. Latest news is that Jugoslavia now also plans to build a sulphate mill. Raw materials, such as wood, chemicals, power and water, are said to be available in the interior. Up till now, sulphate pulp was imported from Austria, Germany, Sweden and Finland.

This also applies to *Sweden*, where a new sulphate mill will be built near Kalmar at the Eastern coast. Production will start in 1956 with a capacity of at least 30,000 metric tons.

During the last weeks, fixations of prices and quantities for export in the third quarter have been made with a number of countries, among which are Holland, Belgium, France, Germany and Italy. Prices have varied considerably but were, on the whole, within the margins of the latest negotiations. In knonor per metric ton, c.i.f., prices for bleached sulphite were between 800 and 850, bleached sulphate 700-750, and kraft pulp 650-700. Small quantities might have been sold at lower prices.

A.P.W.

ONLIWON

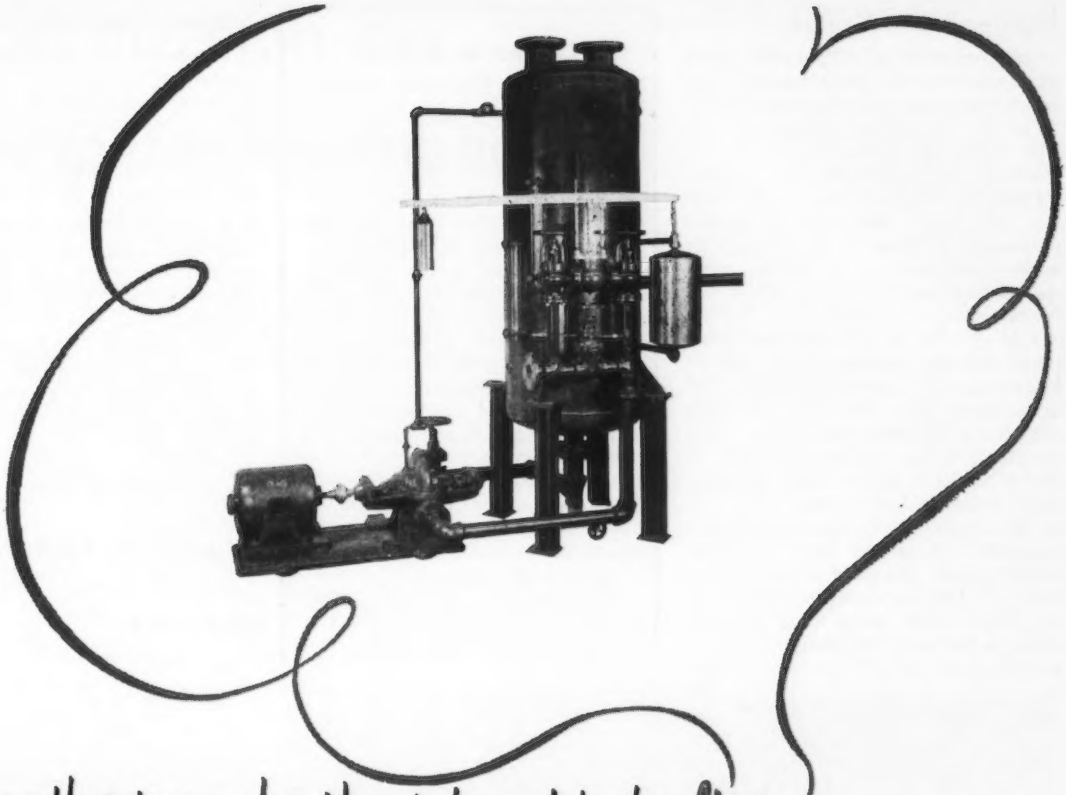
INDUSTRIAL
TOWELS
TISSUE

Propose Revised Box and Container Standards

WASHINGTON, D. C.—Commerce Department's commodity standards division has submitted proposed revisions in its simplified practice recommendations for delivery cases for paperboard milk containers to manufacturers, distributors and users for review and acceptance.

The original recommendation was in 1949 and as revised in 1950, included a simplified list of recommended standard dimensions for delivery cases.

There has also been submitted to manufacturers and others interested a proposed revision of simplified practice recommendations covering folding boxes for garments and dry cleaning, and stock folding boxes for millinery. These include a simplified list of types and sizes of boxes as well as thicknesses of boxboard for standard stock boxes used by dry cleaners, dyers, milliners, etc.



where there's smoke there's bound to be fire

Here's a quality builder, tonnage booster, steam saver and all-round money maker that has long since become standard equipment on all new paper machines and on many of the older ones—Fulton Dryer Drainage on the Dryer Section.

Already close to 1000 such systems are in service—unshakable and absolute proof that Fulton Dryer Drainage is an indispensable drying aid. Surely where there's so much smoke there must be fire.

The foregoing is not addressed to Superintendents with the more modern machines under their command for they have Fulton Systems. Rather, it is aimed at the top executives and Superintendents operating older machines—pitched to reach mills with smaller machines. It is there that the hesitation is greatest, the need of better drying conditions most pressing.

If we of Midwest-Fulton can prompt you of the older mills, and you of the smaller mills, to investigate Fulton Dryer Drainage, you'll want Fulton Dryer Drainage. If you'll study it on some of the 1000 machines that have it, you'll go still further and demand it.

- **Applicable to older and smaller machines? Absolutely yes.**
- **Too costly? No. The cost (in the form of loss) is incurred by being without it.**

Get Technical Bulletin—Now

A typical Fulton Sectional Drainage Unit for small machines.

10% to 30% production increase.

Positive reduction in steam costs--even with tonnage gains.

Improved quality. Uniform drying. Less cockle or curl.

Moisture content control. No over-drying.

Engineering survey-machine study. No obligation.

THE MIDWEST • FULTON MACHINE CO.
DAYTON 3, OHIO

Fighting Paper Wanted

Invitations for bids have been issued by the New York Quartermaster Procurement Agency, 111 East 16th Street, New York 3, N. Y., on QM-30-280-53-215, covering Tape, paper, kraft, gummed, 63,000 rolls; and Tape, paper, gummed, water-resistant, paper backing, 101 boxes. Bids will be opened October 9, 1952, at 10:00 a.m. (EST) at the New York office. This procurement is for the U. S. Army, Navy, and Marine Corps.

- QM-30-280-53-222, covering Wadding, cellulose, non-absorbent, 20 lb. kraft-backed, ply construction, 36" wide, embossed, 165 feet per roll; 6,000 rolls. Bids will be opened October 13, 1952, at 1:00 p.m. (EST) at the New York office. This procurement is for the U. S. Army.
- QM-30-280-53-249, covering Paper, manifold, 50 percent rag, unglazed; 79,000 reams. Bids will be opened October 14, 1952, at 2:00 p.m. (EST) at the New York office. This procurement is for the U. S. Marine Corps.
- QM-30-280-53-247, covering Paper, wrapping, waxed, commissary, 200 rolls; Paper, bread wrapping, self-sealing, 200 rolls; and Paper, waxed, dry, 30,000 rolls. Bids will be opened October 16, 1952, at 10:00 a.m. (EST) at the New York office. This procurement is for the U. S. Marine Corps.

Saskatchewan's Pulpwood Resources

Saskatchewan has uncovered vast new resources of woods suitable for pulp and paper production. D. H. F. Black, Director of the Industrial Development Office, announced a program to aid and assist companies interested in opening paper mills in the province.

While earlier estimates of the supply of white and black spruce readily available for pulpwood use was placed at 2,500,000 cords, the inventory made public September 11 shows that there are more than 16 million cords of white and black spruce available. The inventory, at this stage, is only 60 percent complete and covers 75 percent of the timber in the mixed wood belt.

For the newsprint industry this means that paper production resources in Canada which prior to this time had appeared to be reaching the limit of sustained production will now be able to look forward to an increased level of output, with the ultimate level not yet in sight.

By 1954, it is estimated, Saskatchewan's total supply of softwoods suitable for pulpwood will be in excess of 30 million cords.

Letter to Editor

September 11, 1952

Paper Trade Journal
15 W. 47th Street
New York 36, N. Y.

Gentlemen:

The June 27th issue of your magazine which highlighted the Superintendents across the country was received by myself with great interest, as it must have been by all of us. It should prove to bring back many memories in later years. Naturally, I feel that you should be congratulated in the thought and action of this accomplishment.

May I ask that my photograph sent to you for this purpose be returned at some early convenient date?

Very truly yours,
CHAMPION-INTERNATIONAL CO.
John P. Kennedy
Pulp & Paper Mill Supt.

According to Mr. Black, the Industrial Development Office will provide a wide range of assistance to firms interested in opening woodpulp mills in Saskatchewan. Inquiries regarding cooperation between American and Canadian firms and the Saskatchewan government have already progressed beyond the talking stage, Mr. Black revealed.

Among the cooperative efforts offered by the government is the Saskatchewan Timber Board's standing offer to deliver wood to mill sites at agreed prices. The province also offers adequate potential water power and other sources of economical power, including bunker fuels, cheap coal and the possibility of natural gas in the near future.

Other favorable features for a pulpwood industry include the prospect of year round wood delivery via highway and rail. Saskatchewan's relatively level terrain enables road building at minimum costs with maximum efficiency.

The inventory announced covers only areas within economic distance of railway shipping points and an all-weather highway and a number of access roads which now reach into the pulpwood areas.

In addition to the 16 million cords of white and black spruce, the inventory shows that resources of softwoods available for pulpwood now reach a total of 24 million cords.

Sulphur Order Wins Approval

The order of the NPA easing the inventory limitation on sulphur from 25 to 60 days should do much to bring about a more normal flow of this vital mineral to the nation's industry, according to Langbourne M. Williams, Jr., president of Freeport Sulphur Co.

It is one more indication that the sulphur shortage of the last two years is virtually over and that there is enough sulphur to meet practically all requirements.

Mr. Williams last month made public figures disclosing that approximately four million long tons of sulphur will be added to the free world supply by the end of 1955 as a result of nearly 100 new projects to produce the essential mineral in various forms.

Maine-N. H.- TAPPI Program

LAFAYETTE HOTEL, PORTLAND, MAINE

November 7

Registration from 12 noon to 2:00 p.m.

2:00 p.m.
1. A paper by Ralph Carr, Manager of Technical Service, Mathieson Chemical Corp. Title to be announced.
2. "Values of Acidic Reducing Agents in Kraft Bleaching," by H. B. Channon, Technical Service Department, Virginia Smelting Co.
3. "High Density Hydrogen Peroxide Systems," by either R. L. McEwen or F. R. Sheldon, Research and Development Department, Buffalo Electro-Chemical Co., Inc.
4. "Modern Washing and Bleaching at S. D. Warren Co.," by Robert Nivison, Sales Manager of the Improved Paper Machinery Corp.

7:00 p.m. Banquet and entertainment.

November 8

8:30 a.m. A get-together breakfast. A short talk by R. T. Greep, Production Superintendent of the S. D. Warren Co., outlining the trip through the Brown stock and bleaching plant of the S. D. Warren Co.

9:30 a.m. Inspection tour through the Brown stock and bleaching plant of the S. D. Warren Co., Cumberland Mills, Me.

Reservations are to be made direct with the Lafayette Hotel.

Modernization at Champion-International

The Champion-International Co., Lawrence, Mass., has a history that began in the first year of the 20th century and its predecessor, "The Russell Mills," has a history dating back to 1846. For over forty years, Champion-International has supplied the National Geographic Society with all of its coated paper requirements.

During the past few years the mill has been constantly modernized and improved with some increases in production. In addition to the paper mill, which produces 110 tons of coated paper per day, there is a pulp mill making about 50 tons of soda pulp per day.

The pulpwood used is 85 percent poplar and 15 percent mixed hardwoods. It arrives at the mill in four foot lengths, free from bark. Some of it is hand peeled, and some has been barked in portable barkers or rossers.

Although most of the wood is purchased, Champion-International has its own experimental woods operation located at East Jaffrey, N. H. Various methods of bark removal are being tried at this experimental operation. Work is being done on the use of poisons which kill standing trees and at the same time loosen the bark before the tree is felled as well as with various types of portable barkers.

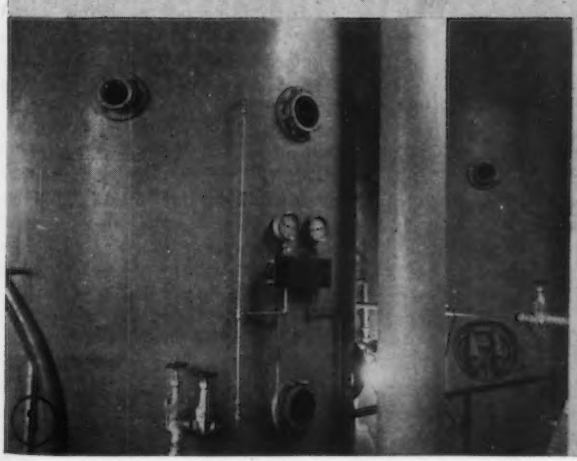
Wood is brought to the mill by rail and truck and may be unloaded into the woodyard for storage or transferred directly to the drag link conveyor that takes it up to the chipper.

The new chipper is a 10-knife Carthage machine with an 84 in. disc. A 200 hp. 700 r.p.m. GE motor drives the chipper through a flat belt.

A Jeffrey bucket elevator carries the chips up to a pair of inclined vibrating screens. Oversize chips are put through a re-chipper and then returned to the screens.

Accepted chips are carried in a bucket elevator up to the top of the two tile chip bins, each of which is 21½ ft. in diameter by 30 ft. in height. A reversible shuttle conveyor distributes the chips to any desired location in either of the two chip bins.

Chips may also be routed from the chipper directly to the bucket elevator that delivers them to the conveyor feeding the digesters. This is a flight conveyor running the full length of the digester house above and to one side



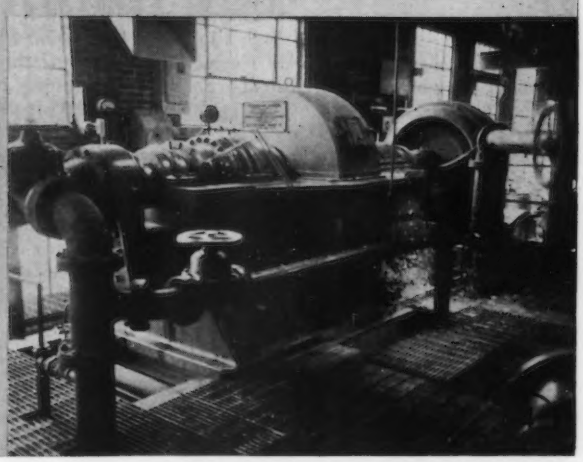


Figure 1—Champion-International Woodyard. Figure 2—Charging Floor, Digester Building. Figure 3—New Zaremba Evaporators. Figure 4—Sutherland Refiner on No. 2 Machine.

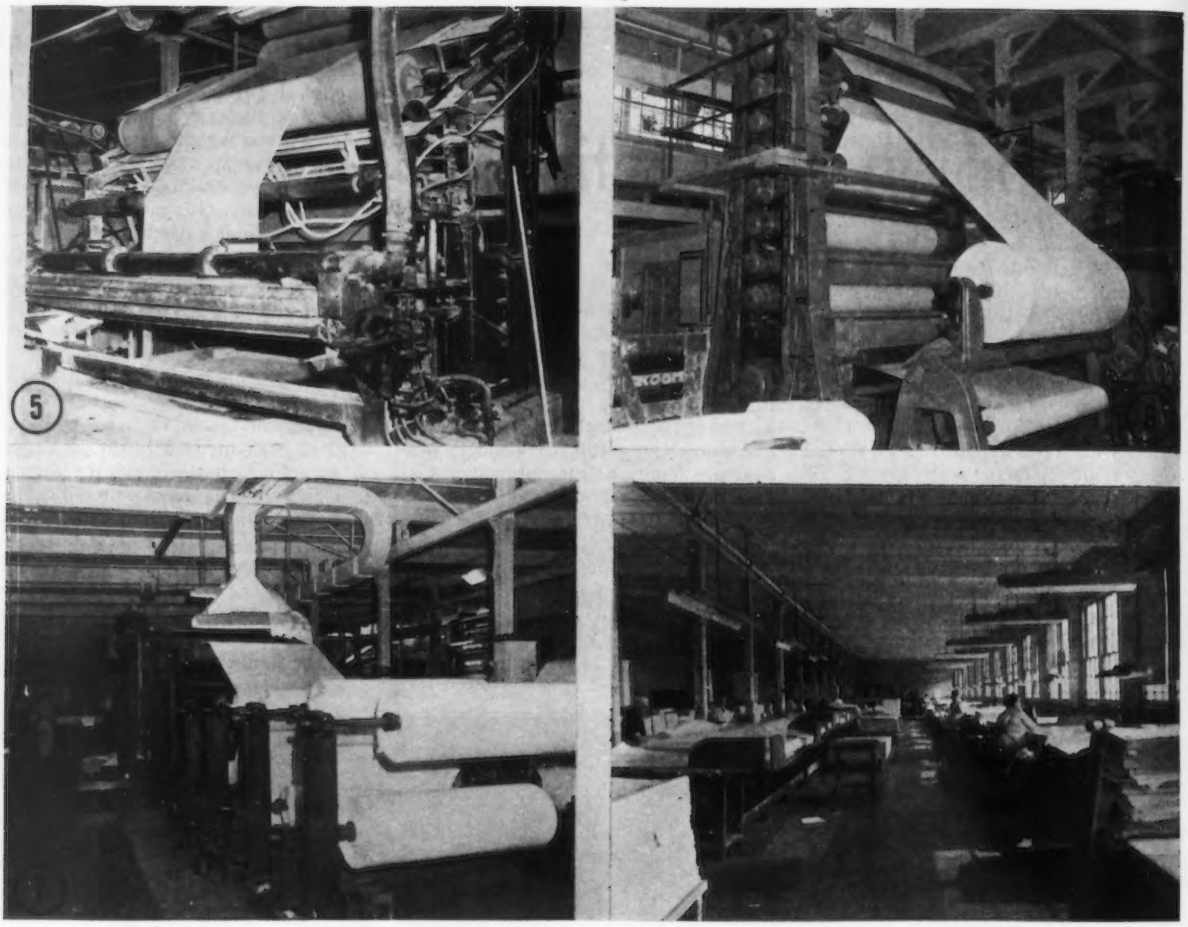


Figure 5—Warren Designed Air Coater. Figure 6—One of Six Super Calenders. Figure 7—One of 20 Sheeters and Lay-Boys. Figure 8—The Modern Inspection Room.

of the digester top openings. To load any given digester, a port in the conveyor above the digester mouth is opened and the chips are carried in a movable chute into the top of the digester.

When chips are being reclaimed from the storage silos, rotary feeders remove the chips from the bottom of each silo and transfer them to the bucket elevator and flight conveyor described above.

Soda Pulp Mill

There are five digesters in the soda pulp mill. The two newer ones each hold 4.1 cords of chips and yield about 2½ tons of pulp per blow. The three older digesters are somewhat smaller, each holding 2¾ cords of chips and yielding about 1⅔ tons of pulp per cook. The cooking cycle is 4½ hours with a total production of about 50 tons per day for the five digesters.

Pulp from the digesters is discharged into a blow tank having a capacity of about 5 tons of pulp at 3½ percent consistency. A Foster Wheeler heat recovery system was recently installed to make use of the steam and hot gases released from the pulp in the blow-pit.

Pulp from the blow tank is pumped to a two-unit Jonsson knotter from which the accepted stock flows directly to the Swenson two-stage vacuum washer. The vacuum cylinder of this washer is six feet in diameter by eight feet long. The washed stock then goes to the line of three Impco flat screens each containing 14 plates.

Accepted stock from the screens is washed and thickened on an Oliver vacuum washer with a cylinder 5½ feet diameter by eight feet long. The thickened stock drops into a storage chest, then pumped to the chlorinating tower. This is a steel tank with rubber lining on the inside and a wooden covering on the outside. The chlorinated stock is washed on an Impco rubber lined vacuum washer equipped with stainless steel cylinder and wire. The cylinder is 5 feet diameter by 9 feet long.

The washed stock drops into three bleaching chests where it is treated with calcium hypochlorite bleach. The three bleachers are operated in parallel. One is equipped with a propeller agitator, and agitation is obtained in the other two by means of circulating pumps. Stock from the bleachers drops into a concrete chest having a capacity of 10 tons of pulp at 4 percent consistency. From this chest it is pumped up to an Impco stock metering system which adjusts the consistency and then measures the volume in a rotary displacement meter. The stock then flows to an Oliver vacuum washer located in the paper mill beater room. This washer has a cylinder 5½ feet in diameter by 10 feet long. The washed stock drops down into another concrete chest having a capacity of 20 tons of pulp at 4 percent consistency. This stock is now ready for use in the paper machine stock preparation systems.

Soda Mill Recovery System

Black liquor from the two stage Swenson vacuum washer is collected in the seal tanks and then pumped to the three black liquor storage tanks. The strong black liquor is then pumped to the evaporators. The evaporating system was rebuilt in November, 1951.

ASTEN

dryer felts

Every inch a Queen

The judges who keep their eyes on things, machine tenders, for instance, usually recognize the merits of ASTEN Dryer Felts.

Economy in the long run

ASTEN-HILL MFG. CO.
PHILADELPHIA, PENNA.

ASTEN-HILL LIMITED
VALLEYFIELD, QUEBEC

Prior to that time there was a small, four-effect, four body Zaremba evaporator. Two new double-size Zaremba bodies were installed and the existing four bodies were paired up to make two effects with twice the former capacity. Thus the new four effect system has approximately twice as much capacity as the old system.

Heavy black liquor from the evaporator is pumped to the two rotary furnaces where it is burned, with waste wood being used as a supplementary fuel.

Black ash from each furnace flows into a quenching tank where the chemicals are leached out with weak liquor. The green liquor thus produced is siphoned off into a group of clarifying tanks from which the clarified liquor flows into a group of slaking tanks where lime is added. At this point the system is divided into two parts, one part using high calcium lime and the other Dolomite. The latter is used to produce Calcium Magnesium Carbonate during the causticizing process. This carbonate is used as a coating pigment in the coating mill. Four causticizers are used with Dolomite and two with regular lime. Liquor from both causticizing systems then passes to clarifying tanks before going to white liquor storage. The lime sludge is discarded, but Dolomite sludge is filtered on a new Oliver vacuum filter and redispersed in water containing soda ash before being washed on a Kelley leaf filter press. This is a specially designed sludge filter having a cylinder 8 feet in diameter by 14 feet long. The new sludge filter is the first step in a complete rebuilding job for the Calcium Magnesium Carbonate system.

PAPER MILL

Broke and Waste Reclamation

Since the pulp mill produces only short fibered soda pulp, long fibered pulp must be purchased.

A recent equipment installation allows the use of reclaimed stock such as hard shavings, clippings from the manufacture of paper milk bottles, bottle caps and butter cartons, to supply part of the long fiber requirements. This installation consists of a Rice Barton Dynopulper, two tile lined stock chests and a three stage Impco stock washing system. The stocks are defibered in the Dynopulper which has two, abrasive studded, dish shaped impellers rotating in opposite directions. The pulper tub is oval-shaped with the impellers at either end having the concave surfaces facing each other.

Defibered stock is dropped into one of the tile chests from which it is continuously pumped to the washers. These are Lancaster type filters with tile vats. Stock flows consecutively through the first, second and third stages of the washer and then drops into the tile lined washer stock chest. Both of the tile stock chests are equipped with propeller type agitators. This system has a capacity of about 50 tons of stock per day, and was designed so it may also be used for deinking of printed waste.

Stock Preparation

At present the mill is equipped with five beaters which will soon be replaced with pulpers.

The beaters are now in part time operation for breaking up and beating baled long-fiber pulp, as well as for blending the different stocks, and adding size, alum, fillers, colors etc. The mixed stocks are then dropped into the machine beater chests, one for each of the two paper machines.

Stock is pumped from number one beater chest through a De Zurick consistency regulator, then to a headbox which feeds a pump sending the stock to a 32 inch Sutherland Refiner and a No. 2 Emerson Refiner arranged in parallel. Stock from the refiners drops into the machine chest from where it is pumped through a De Zurick consis- and thence to the machine headbox.

Stock from number two beater chest is pumped through a De Zurick consistency regulator and thence to a headbox from which the stock flows to a pump that sends it to a 48 in. Sutherland Refiner and a No. 3 Emerson Refiner connected in parallel.

Stock from the refiners drops into number two machine chest from where it is pumped to the twelve Dirtecs and thence to the machine headbox.

Both Emerson machines are equipped with Emerson automatic plug controls that hold uniform pressure on the plug and automatically back the plug off if the stock supply should fail. These instruments also provide remote manual setting and adjustment.

Paper Machines

Both paper machines have been in operation for a considerable length of time. Number one, which is a Rice Barton Fourdrinier with a wire width of 130-inches and trimming 118-inches, was built in 1921. Number two, which is a Horne Fourdrinier with a wire width of 166-inches, trimming 154-inches, was built in 1928.

Number one machine has one six roll calender stack and number two machine has two five roll stacks. Both machines are equipped with Pope reels and Moore & White four drum winders.

New Auxiliary Equipment

An installation of three tanks equipped with agitators and pumps has recently been completed for the preparation and handling of chemical additives to the head box.

Two tanks lined with vinylite plastic were recently installed for handling liquid alum. The liquid alum is shipped in tank cars and pumped into the concentrated alum storage tank. From here it is pumped to the dilute alum storage tank with a measured amount of water to make the dilute alum solution.

Coating Mill

There are six coaters, five of which are reverse roll units and the other an air brush coater. The roll coaters are all two-side coaters equipped with Merrill dryers. The widths are 90-inches, 65 - inches, 65 - inches, 45-inches and 45-inches.

The air brush coater coats one side only and handles sheets up to 85-inches wide. This machine is designed and licensed under S. D. Warren patents. It is equipped with an enclosed air dryer built by C. J. Merrill Co., Portland, Maine.

An important part of a coating plant is the preparation of the coating mixes and the handling of the large amounts of mineral pigments.

The two most important pigments used in the coating mixes here are clay and calcium carbonate.

Clay is shipped to the plant in box cars, each containing about 40 tons. It is unloaded with a Butler Car Scoop which is a modified lift truck equipped with a power operated scoop. The cars are spotted on a covered railroad siding. The clay is picked up in the scoop and deposited through a steel grating into a receiving bin, from which a Redler conveyor system carries it up to four tile storage silos. Each silo has a storage capacity of 250 tons of clay. The bottom of each silo has a hopper and feeder opening into a mixing tank located directly underneath the silo. Here the clay is mixed into a heavy solid slurry with water and then pumped up to seven clay supply tanks equipped with agitators to maintain uniform consistency. The concentrated slurry is forced by air pressure from the supply tanks as needed.

The Calcium Magnesium Carbonate production system which is licensed under the Rafton patents, uses a mineral coating material consisting of calcium carbonate and magnesium hydroxide. The particles are finely dispersed by pumping the water slurry through a Rafton Mill. This action is not intended to reduce the size of the particles, which are normally very fine, but merely to break up agglomerates to obtain the ultimate particle size.

The pigment thus produced has a

very high whiteness and produces coatings with a smooth finish, superior to that obtained with calcium carbonate. Of course this pigment is seldom used by itself but usually blended with clay. Both starch and casein are used as coating adhesives, depending on the grade of paper.

Cotton fiber rolls are used, in the supercalenders, in preference to paper rolls in this mill.

Power Plant

A Riley boiler burning pulverized coal supplies the steam requirements of the mill. This boiler produces 70,000 lbs. of steam per hour at 400 p.s.i. There are also two standby boilers with steam capacities of 30,000 lbs. per hour each.

Coal is brought to the mill in railroad cars and unloaded on a trestle. The coal is carried up in bucket elevators to hoppers located about the boiler operating floor. Most of the electrical requirements of the plant are supplied by two steam turbine generators and two hydro-turbine generators.

The steam turbine generators are General Electric, one 2500 kw and one 1000 kw. Both use steam at 375 p.s.i. and generate 3 phase 60 cycle current at 600 volts.

The water wheel generators are Westinghouse, one 500 kw and one 1000 kw. Both are driven by Leffel hydro-turbines made by James Leffel Co., Springfield, Ohio.

A 600 kw substation connected with the public utility provides an emergency auxiliary power supply.

Finishing Department

An important part of the mill is the finishing room. A high percentage of the production of this mill is sent out in sheet form.

Equipment includes 20 rotary cutters with lay-boys capable of taking rolls up to 90-inches wide. These machines will cut from one to 8 rolls simultaneously and many have duplex cutters.

There are six trimmers, three of which are new. Five of these machines are Seybold and one is a Smith and Winchester.

The following management and executive personnel are responsible for the successful operation of this mill:

Administrative Personnel: K. M. Hanson, president; N. I. Bearse, vice-president in charge of production; J. F. Raichlen, vice-president in charge of sales; J. J. Calnan, purchasing agent, assistant to the president; C. D. Heubeck, director of industrial relations; W. G. Hartford, assistant production manager; J. P. Kennedy, managing paper and pulp division; A. D. Bonanno, manager coating and finishing division; D. Driscoll, superintendent, shipping, warehousing and receiving; L. A. Field, plant engineer and J. Frankwicz, technical director.

Equipment and Suppliers

Wood Yard Conveyors, Lee H. Long Co.

Chipper, Carthage Machine Co.

Chip Silo, Kalamazoo Tile.

Conveyors and Elevators, Jeffery Mfg. Co.

Evaporators, Zaremba Co.

Chemical Recovery Filter, Oliver Co.

Broke Pulper, Rice-Barton Corp.

Three Stage Washer, Improved Paper Machinery Co.

Stock Chest, Stebbins Engineering Co.

Pumps, Shartle Bros., Lawrence Pump & Engine Co., and Lawrence Machine & Pump Co.

Steel Tanks, Merrimac Boiler Co.

Ventilating Equipment, C. J. Merrill Co. and Wolverine Equipment Co.

Dirtec System, Bird Machine Co.

Clay Silos, R. A. McMullin Co.

Coating Machine, Rice-Barton Corp.

Trimmer, Seybold Co.

Oxford Modernization

More than $19 million has been invested by Oxford Paper Co., 230 Park Avenue, New York City, in modernization and additions to manufacturing facilities since the close of World War II. What Oxford officials call "the continuing story of expansion and modernization" has focused primarily at Rumford, Maine, where the company operates what is said to be the world's largest book paper manufacturing plant located under one roof.

Considerable of the current phase of the program centers on facilities for the production of machine coated paper. After long research and planning, followed by purchase and installation of the necessary machines and auxiliaries, Oxford entered the then relatively new machine-coated field in 1947. Since that year Oxford's production of this type of paper has risen to roughly three and a half times the original tonnage. In relation to the industry's total production of machine coated paper, Oxford's contribution, percentage-wise, has doubled since 1947. As for the general production picture at Rumford, the modernization places the company in a position to manufacture 36 percent more paper and 44 percent more pulp than formerly, and also has resulted in important operational saving.

Key steps in the program to date may be outlined as follows: erection of a new Rice Barton machine for making paper and coating on the machine, conversion of another machine to this purpose, and the rebuilding of two machines to a combined daily capacity of 110 tons of finished uncoated paper.

Another important and basic step in the modernization was the conversion of the soda pulp mill to hardwood kraft production of 240 tons daily, and the recovery plant in connection with it. Steam and electric capacity also had to be increased substantially by the addition of a new boiler and a new steam turbine.

Installations of new finishing and shipping equipment have also been part of the current phase of capital investment at Oxford.

Rumford's efficiently integrated production facilities now include the following: 13 paper machines, two with a combined capacity of 200 tons for machine coated paper, nine for uncoated paper (some of which also manufacture film coated paper), and two machines used currently for drying 45 tons of pulp daily. There are four conversion coating machines capable of coating both sides in one operation, and eight conversion coaters for coating one side. There is a 62-ton capacity pulp dryer.

Pulp-making equipment now includes two sulphite pulp mills with combined daily capacity of 240 tons, the new hardwood kraft pulp mill with a capacity of 240 tons daily, and the

groundwood pulp mill with 50 tons capacity per day.

Related equipment includes an electrolytic bleach plant, and power equipment capable of generating 20,000 hp. which supplements hydroelectric and hydro-mechanical equipment to make a combined capacity of 47,000 hp. of energy. Rumford also produces 100 percent of the caustic and 60 percent of the chlorine which it uses in pulp and papermaking and, in addition, possesses facilities for reclaiming, for reuse, about 90 percent of the sulphate liquor employed in the new hardwood kraft pulping.

Oxford's principal manufacturing facilities, of course, are at Rumford. But important to the production facilities is a wholly-owned subsidiary, the Oxford Miami Paper Company at West Carrollton, Ohio. The Ohio facilities comprise four paper machines, a 50-ton pulp plant reclaiming fibers from high grade waste paper, and a 5,000 kw capacity steam generating plant installed in 1948. The combined capacity of Rumford's mills and this West Carrollton operation now is almost 700 tons daily.

T. F. Spear is assistant vice-president and mill manager at Rumford, completing his 33rd year in the Rumford mills. Walter Holland was recently appointed production manager at Rumford. H. J. Buncke is manager of engineering, and C. L. Ferguson, mill superintendent, this year celebrates his 35th anniversary at the operations on the Androscoggin River. Paul Petzold is mill manager of the West Carrollton mill.

Important in the postwar modernization program, as well as in future plans at Oxford, are the research and engineering facilities which have been maintained at Rumford for more than 26 years. E. L. Lamb is director of research. Included in the achievements of this department have been substantial improvements in pulping methods, utilization of various wood species abundant in Maine, a number of new products for the Oxford and Oxford Miami lines, as well as appreciable savings in manufacturing processes.

Recent personnel shifts at the New York headquarters office of Oxford placed A. M. McBurney as general sales manager, and V. B. Taliaffero as eastern sales manager in addition to his duties as advertising manager. Two other moves were the appointment of H. M. Annis as manager of Product Development and C. N. Stupp as manager of Sales Service.

M & O Improvements Emphasize Diversification

MINNEAPOLIS, Minn.—With emphasis on diversification, the Minnesota and Ontario Paper Co. continued to modernize and improve its plant facilities last year.

Several important modernization steps were taken this year at M. and O.'s three mills at Fort Frances and Kenora, Ont., and International Falls, Minn. These steps were part of the firm's long-range modernization program started in 1945. Since that date, more than $29 million has been expended, according to J. B. Faegre, Mando president. So that today, Mando makes eight different kinds of pulp from which a variety of papers are manufactured.

Highlights of the 1952 plant modernizations are as follows:

International Falls—Partial modernization of No. 2 paper machine; two new barkers; modernization of No. 2 Insulite machine; and replacement of steam locomotives with diesel electric engines on the firm's International Falls mill railroad.

Fort Frances—Construction of a new wood room and a new grinder room.

Kenora—Construction of a new bark recovery system and improvements on No. 8 and No. 9 paper machines.

During the seven-year period from 1945 to 1951 the following modernizations were completed at the following locations:

International Falls—Coal bunker for steam plant, groundwood bleachery, Mando coater for production of coated-one-side paper, loading shed for truck shipment of paper, building enclosing the pulp storage tanks, heating, ventilating and heat recovery system for the three paper machines, extension to the Insulite train shed, Insulite fabricating machinery, including a plank machine, an acoustical tile drilling machine and planer, installation of a kraft pulp bleach plant and sulphite pulp bleach plant, construction of water treating and filtration plant, rebuilding and modernizing No. 4 paper machine, installation of two 7,500 KW steam electric power generating units, replacing the hand-fed pulpwood grinders with magazine fed grinders, addition of a third digester in the kraft paper mill, construction of bark disposal facilities, modernization of pulp preparing and refining systems, installation of super-calendars, installation of No. 4 Insulite machine, building and equipping of a research laboratory, extension of paper mill control and testing laboratory facilities, installation of an electro-static precipitator, rehabilitation of No. 3 Insulite machine and extension of pulp screening facilities.

Fort Frances—Broke beaters for No. 5 and No. 6 paper machines, rebuilding and modernizing No. 6 paper machine, partial adaptation of steam generating equipment to the use of lignite fuel.

Kenora—Widening of the pockets of six of the magazine grinders, complete adaptation of the steam generating equipment to the use of lignite fuel.

Mr. Faegre said that these modernizations plus the modernizations completed or contemplated this year will push Mando's modernization and improvement program past the $29 million mark. The flexibility and diversification resulting from these modernizations allows the company to better serve its customers, Mr. Faegre added.

Returning to the 1952 modernizations at International Falls, Mr. Faegre said the rebuilding of No. 2 Insulite machine increased the daily output of the company's four Insulite machines by 25,000 square feet. The four machines now produce 1,275,000 square feet a day.

It marked the first extensive remodeling and building job performed on No. 2 since it was installed in 1928.

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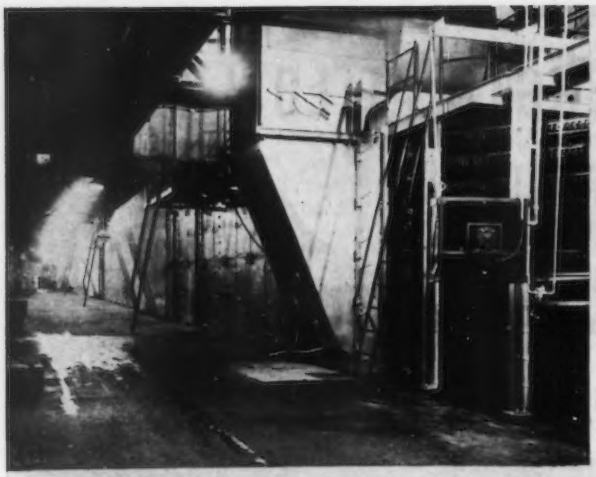


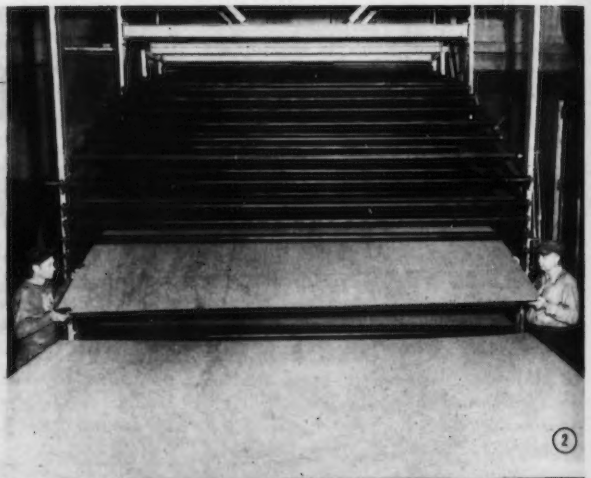


Figure 1—General View of Recently Modernized No. 2 Insulite Machine at International Falls, Minn. Figure 2—No. 2 Insulite Machine in Operation after being Modernized. Figure 3—An Exterior View of the New Fort Frances Woodroom Showing the Jack-Ladder Type Conveyor that Extends from the Center of Rainy River to the Woodroom. In the Foreground is the Chain Conveyor that Brings Logs from the Woodyard to the Woodroom. Figure 4—Interior View of Fort Frances Woodroom Showing the New Barking Drums and Fluorescent Lights.

Increased output and greater efficiency of No. 2 were accomplished by completely rebuilding the 360-foot drying kiln, addition of a 30-inch suction roll, replacement of the headbox and other major changes. The air circulation system, designed to remove water from the Insulite sheet, was transformed into a three-zone system, replacing the existing two-zone one. More rolls were added to the kiln. Approximately a mile of heating pipes were added to the drying unit and about a third of the present coils were replaced. A new 30-inch suction roll replaces a solid press roll. Three new calipers for recording the thickness of the board as it comes off the forming cylinder were installed.

Installation was under the direction of the plant engineering force with assistance from Downingtown Manufacturing Co., Downingtown, Pa., and the Coe Manufacturing Co., Plainsville, Ohio.

Mando engineers plan to shut down No. 2 paper machine that fall for a partial modernization. A new electrical drive and a second suction press is scheduled to be installed. The new drive is supplied by Reliance Electric and Engineering Company.

Last January, work was completed on the installation of two 12 by 45 foot barking drums. They were equipped with 200 hp. driving motors with a hydraulic coupling between motor and drive. The barkers are of the water vat type and were furnished by Fibermaking Process with the foundations laid by Paul A. Laurence Co., Minneapolis, Minn.

The buying of a fourth diesel electric locomotive this year marks the end of the steam engine era as far as Mando's International Falls mill railroad, the Minnesota, Dakota and Western Railway, is concerned. The conversion to diesel from steam power began in 1949. The four diesels replaced a like number of coal burning locomotives that have been in service for more than 30 years.

Highlight of this year's modernization activity at Fort Frances was the erection of a new woodroom. Put into production during the spring of the year, the new woodroom completes a program of modernizing the woodrooms at Mando's three mills. The Fort Frances woodroom replaces existing facilities, a part of which has been in operation since 1914, when the mill was constructed.

The new facilities are housed in a 73 by 164-foot steel and brick building. With the use of time and labor saving equipment in the new woodroom, barking for a 24-hour groundwood operations is now done in 16 hours. Under the new plan of operations, logs are hauled from the Rainy River and from the nearby wood yard by modern conveyors made by the Vulcan Iron Works, Winnipeg, Manitoba. The river

conveyor includes an extended jackladder that reaches out 120 feet into the river where the water runs deep and fast. The swift current brings the logs to the mouth of the jackladder. The conveyor then rises and crosses the railroad tracks between the river and the woodroom on an overhanging bridge.

Logs from the wood yard reach the woodroom via a 420-foot conveyor. This conveyor brings logs to the woodroom that were shipped to the mill by either truck or rail.

The new woodroom has four 12 by 45-foot barkers as compared with six 9 by 30-foot barkers in the old woodroom. The barking drums are supplied by Horton Steel Works, Ltd., Fort Erie, Ont. Power for the barkers comes from individual 150 hp. electric motors through texrope drives. The electrical equipment is from Canadian Westinghouse, Hamilton, Ont.

Working conditions in the new woodroom are greatly improved. Lunch, locker and washroom facilities are on the ground floor, under the slasher area, and are finished in cream-colored tile. Two-hundred fluorescent units of two 40-watt tubes in each fixture give the new room ample light. Heating and ventilating systems by Ross Engineering of Montreal are a part of the new structure.

The building was erected by Stead and Lindstrom, Port Arthur, Ont. Foundations and floors are reinforced concrete. Roof construction consists of a poured concrete slab on steel purlins, insulated with one inch of Insulite and topped with built up roofing.

With earth moving activities under way the first week of June this year, Mando's new groundwood mill will be designed to process logs produced by the new woodroom. The new magazine grinders will use four-foot lengths, replacing the present hand-fed grinders using two-foot lengths.

The new grinder room will replace all existing grinding facilities, a majority of which have been in operation since 1914, the year the Fort Frances mill began producing paper. Thirteen Waterous Super Hydraulic Magazine type grinders will be installed. They will replace 14 old style pocket grinders. Allowance has been made for the addition of a 14th grinder.

Six new 5,500 hp. motors will drive 12 of the new grinders with the 13th grinder receiving its power from a 3,500 hrp. motor now on hand. The 85 by 275-foot building will be of steel frame, to be built by Dominion Bridge Co. An insulated metal sandwich, prefabricated sheeting, will form the walls, supplied by Robertson Irwin of Hamilton, Ont.

The magazine grinder will be loaded from the third or charging floor. Wood conveyed to this floor will be sorted by species for the grinders. Total capacity of the new grinders on newsprint production is estimated at 425 tons a day. In addition to newsprint stock 90 to 100 tons of Insulite stock may be ground daily.

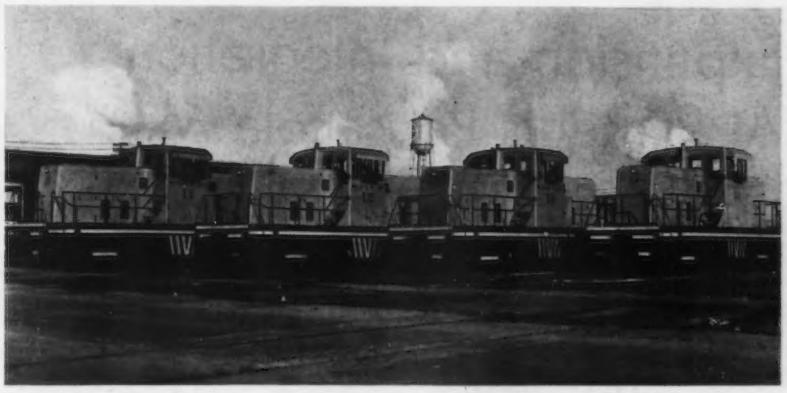


Figure 5—A Fourth Diesel Locomotive Marks the End of Steam Locomotion at the International Falls Paper and Insulite Mill.

Washroom, locker and lunchroom facilities will be modern and ample. The building will be air conditioned by Ross Engineering. The new grinder room is expected to be in production by the middle of 1953.

At Mando's Kenora newsprint mill, the bark recovery system was modernized. When completed, the new bark recovery system will more efficiently remove bark from the waste water before it goes into the river and will reduce handling costs. Started the middle of this year, the new bark recovery facilities will be housed in a 28 by 26-foot brick structure. The new building will be attached to the existing woodroom.

Figure 6—New Bark Recovery System at Kenora, Work on which began This Year. It Includes a Five Foot Diameter by 18-Foot Long Circular Watering Screen. The New Structure Will Be a 28 x 26-Foot Building.

The new system provides for the sluicing of the bark from the four 12 by 45-foot barking drums to a five-foot diameter by 18-foot long circular dewatering screen. The bark from the screen is then carried to a chipepr via a rubber belt. From the hog, it goes to the bark presses. Water, containing fine bits of bark, flows from the screen to a Tyler vibrating screen.

Once the bark is removed from the waste water it is pressed into blocks and later burned. The waste water is pumped to the sewer or is used as shower water on the barking drums.

Other major improvements at Kenora include pre-heaters for No. 3 and No. 4 boilers, installation of dust collectors on No. 3 and No. 4 boilers, installation of steel trusses on transfer and cross conveyors, replaced barking drum, tile line and replace agitators in groundwood decked chest, replace Bird screens on No. 8 paper machine, replace dryer motors on No. 8 machine, replace master shaft on Harland drive, new heat recovery system on No. 9 paper machine and new heating and ventilating system for sulphite and screening room.

Equipment and Suppliers

Board Machine, Downingtown Mfg. Co.

Improvements, Coe Mfg. Co.

Paper Machine Drive, Reliance Electric & Engineering Co.

Barking Drums, Fibre Making Process Co.

Screens, Bird Machine Co. and W. S. Tyler Co.

Air Conditioning, Ross Engineering, Montreal

Barking Drums Horton Steel Works

Wood Yard Conveyors, Vulcan Iron Works

Electrical Equipment, Canadian Westinghouse Corp., Ltd.

Grinders, Waterous, Ltd.

Expansion and Integration At St. Regis Pensacola Mill

Expansion and integration of the Kraft Division of the St. Regis Paper Co. at Pensacola, Fla., has been accomplished this year with the completion of new facilities which raise the company's capacity at that plant by 100,000 tons of kraft paper and board to a total of 265,000 tons annually. With the completion late this year of the new plant now under construction at Jacksonville, the company's kraft-making potential in Florida will be 550,000 tons a year.

This is all part of a long-range program which was instituted when the St. Regis Paper Co. acquired control of the Florida Pulp & Paper Co. in 1946 and Alabama Pulp & Paper Co. in 1947 whose plants were on adjoining sites at Cantonment, 15 miles north of Pensacola. The Alabama company's plant, a 250-ton a day unit, made its first paper in March, 1948. In December of that year the Alabama and Florida companies' plants were merged with St. Regis.

In the design of the Alabama company's plant provision was made for future expansion of the pulp and paper making facilities. This layout made it possible for the St. Regis Paper Co. to duplicate the original plant so far as structures and equipment are concerned.

The principal change from the original plant was in the selection of a paper machine that would provide as much flexibility as possible in making a broad range of grades. Thus the No. 4 machine, installed this year in the enlarged plant, is wider and has more dryers than the No. 3 machine which it supplements.

This new machine, built by the Bagley & Sewall Co., Watertown, N. Y., is a fourdrinier type with a wire 228 in. wide and 120 ft. long for the fourdrinier section, has a speed of 2400 ft. per min. and is designed to manufacture paper with a trim of 210 in. The fourdrinier section is equipped with a 28-in. dia. breast roll and a 44-in. dia. couch roll, Panelyte covered stainless steel forming boards, rubber covered wire rolls, 10 Panelyte covered stainless steel suction boxes, mounted on stainless clad box section frames, and is arranged for shake from three motor-driven shake units. The entire fourdrinier frame may be supported cantilever-wise from the backside of the machine by four hold-down positions to permit drawing on a wire that has previously been draped in position on carriages and supports in the tending aisle.

The machine is equipped with a pressure type inlet and hydraulic nozzle slice with perforated rolls and drives, combined with a flow spreader, which are placed ahead of the fourdrinier section. This equipment, of stainless steel and stainless clad construction, was furnished by the Pusey & Jones Co., Wilmington, Del. To provide for varying quantities of stock suspension liquid, from 0.2 to 0.25 per cent, depending upon the weights of paper being made, the machine is equipped with a 30,000 g. p. m. Ingersoll-Rand centrifugal pump, driven by a Westinghouse 300 hp., 400 rpm. synchronous motor through an Electric Machinery Co.'s magnetic drive coupling, which permits adjustable speeds of the pump for controlling the flow through the pressure inlet and slice arrangement to the fourdrinier section.

The press section of the machine consists of two sets of heavy housings for 36-in. dia., rubber covered, suction bottom press rolls, which are arranged for straight through operation without reversing. The 30-in. dia. top press rolls are provided with a Stonite cover for the first press and a rubber cover for the second press. The top rolls are equipped with hydraulic cylinders for pressure and lifting. Supported by the press frames and arranged for independent gear motor drives are 22-in. dia. Neoprene covered lump breaker rolls, with cylinders for hydraulic lift and pressure, and an 8-in. rubber covered draw roll, with cylinders for hydraulic lift. For each of the two press and felt sections, there have been provided a stainless steel 15-in. dia. Save-All pan, rubber covered felt rolls, a Panelyte covered stainless felt suction box, a shower pipe, and a Vickery felt conditioner with four Jordan-type shoes.

On the ground floor of the mill are eight vacuum pumps, made by the Nash Engineering Co., which provide for the water and air removal requirements of the suction couch roll, the two press rolls and the flat boxes. For the couch roll two H-12-A pumps are used; for the two press rolls, two H-11-A pumps; for the flat boxes, one K-9 pump; for the felt conditioners, one K-6 pump, and for the felt boxes, one K-7 pump. An additional H-12-A pump serves as a booster pump for any one of the systems, being hooked up with the piping in such a way as make this possible. Pumps are individually motor driven through a Texrope drive and Maxim silencers have been installed on the discharge lines.

A smoothing press, which follows the press section of the machine, consists of a Stonite bottom roll and a rubber covered top roll, each 30 in.

Figure 1—The Company's Jack Lawton Nursery, a 10-Acre Tract, the Largest Privately Owned Slash Pine Nursery in the Country, Will Grow 10 Million Seedlings This Year, of Which About a Million Will Be Distributed to Tree Farmers Who Supply Pulpwood to the Company. Figure 2—Grown from Seedlings Started in the Company's Nursery, These Pines Are Five Years Old.

Figure 3—Expanded Pulp Mill Houses Seven Added Digesters of 2700 cu. ft. Capacity, Furnished by the Chicago Bridge & Iron Co. Figure 4—To House the New No. 4 Paper Machine, Built by the Bagley & Sewall Co., the Machine Building of St. Regis Paper Co.'s Pensacola Mill Was Expanded 44 by 396 ft. At the Left Is the Expanded Finishing, Storage and Shipping Room, Which Joins Up with the Bag Factory.

dia., which are mounted in a box section type of frame connected with the dryer frames. Pressure loading is applied by a hydraulic cylinder.

There are 70 paper dryers and 18 felt dryers, all 60 in. dia. by 226 in. face, arranged in four sections with four indriving shafts. The first and second sections each have 20 paper dryers, four Feeney felt dryers and two conventional felt dryers. Between the second and third dryer sections is a breaker stack, which has 30-in. dia. top and bottom rubber-covered rolls. The third section has 19 paper dryers, two Feeney felt dryers and two conventional felt dryers. Between that and the fourth section is a size press, with a rubber-covered bottom roll and white Stonite top roll, each 30 in. dia. The top size press roll is independently motor driven by a motor reducer unit and gear arrangement. The fourth section consists of 11 paper dryers and two conventional dryers.

Dryers were designed for 75-lb. steam and 150-lb. water pressure, are equipped with anti-friction bearings, an enclosed type of dryer gears with teeth of special helical form between the dryer face and the bearings, are lubricated by a Bowser circulating oil system installed on the ground floor, have lodding doctors on the first and last dryers of each section, are equipped with a Sheahan automatic rope paper carrier, and the automatic felt guides for the press sections and the wire guide for the fourdrinier section are hydraulically operated and mechanically controlled. Other auxiliary equipment includes a Mid-West Fulton condensate removal system, Foxboro pressure drying control on all four sections of the dryers and a Stamm moisture control system on the first and third dryer sections. Two stacks of calenders with open-end housings each have eight Farreloy rolls and Lodding oscillating doctors so that rolls can come out sideways. The king roll in each of these stacks is 34-in. dia. by 220-in. face and weighs about 30 tons. Following the calenders is a Beloit standard type board reel capable of producing a 76-in. dia. reel as a maximum. The unwinding stand has regenerative braking, equipped with solenoid-operated shoe brakes so that a large reel of paper can be stopped from top speed in about 10 seconds. The winder, designed and built by the Bagley & Sewall Co., will wind 62-in. dia. rolls at a maximum speed of 5000 ft. per min. It is equipped with two 18-in. dia. rewind drums, individually motor driven through V-belt drives; air operated score cut slitters, power driven rider roll lift and a hydraulic unloading table for lowering rolls to the floor.

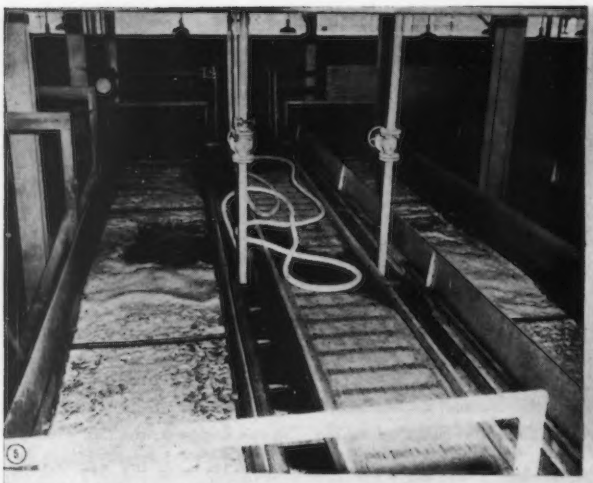
Vickers, Inc., designed and built the hydraulic system for the machine. There are actually five basic systems, one each for the fourdrinier, automatic guides, felt stretch, presses and calender. Four of these are served by a power unit at the wet end of the machine. There are duplicate pumping systems to prevent shutdowns. The calender system has its own power unit. The hydraulic systems for the winder and unloading table are separate, having their own power units built into the equipment. They are controlled from the power control desk.

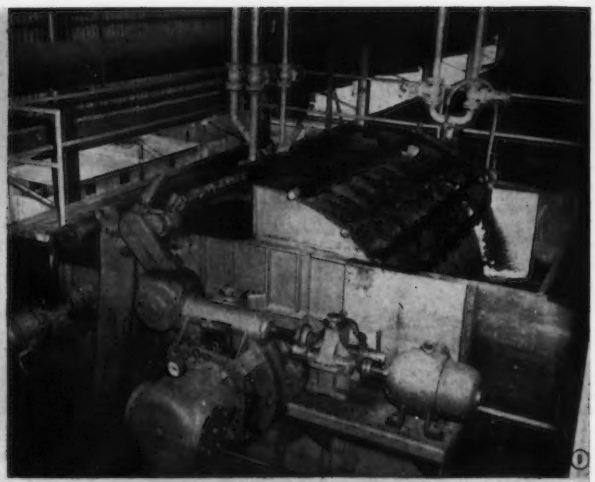
The paper machine is driven by a Westinghouse sectional electric motor drive with automatic control and electronic speed regulation. The motor-generator set consists of a 3000 hp. synchronous motor of 2300 volts, a 2000 kw. direct current generator of 600 volts, a starting generator with exciter sets, speed regulating equipment, ventilating blower (a. c.) and d. c. control switchboard and the 250 hp. motor-generator set for the winder drive being located in an enclosed room under the drive aisle about midway of the dryer section.

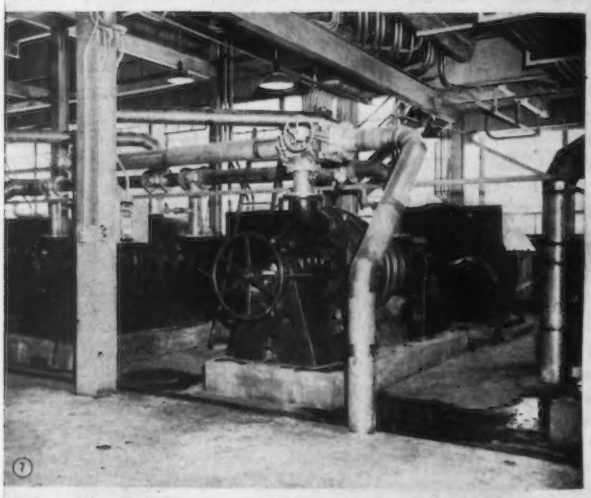
Cranes serving the No. 3 and No. 4 paper machines consist of two 15-ton trolley hoists, first installed over the No. 3 machine but extended to cover both machines by the Shaw Crane Division of Manning, Maxwell & Moore, Inc., which furnished the original crane; also by a new 6-ton Euclid, electrically operated and controlled hoist, which serves the area between the reel and winder of the new machine. This crane transfers the paper reels from reel to unwinding stand and returns the empty reel spools to the reel.

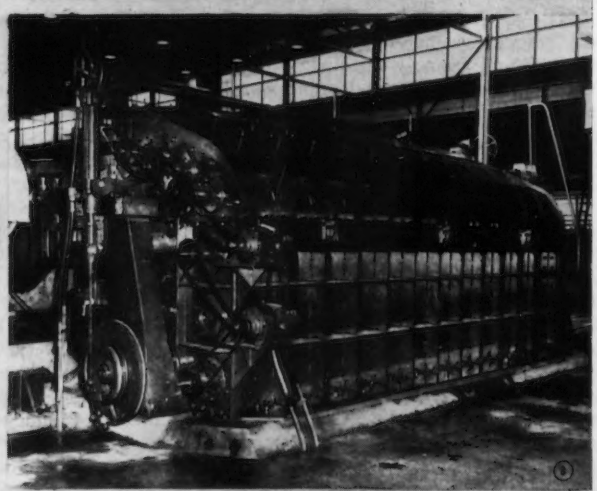
The J. O. Ross Engineering Corp. furnished a hood and exhaust system for the dryer section, a Ross-Grewin system and a roof heating and ventilating system. A 240-ft. long transite panel hood, with side curtails of transite panels, covering the dryer section of the machine, has nine exhaust outlets to 60-in. B. F. Sturtevant Co.'s Axiflo type fans, located on the roof over the drive aisle back of the machine. For handling dry broke and shavings from the end of the machine, the Shartle Brothers Machine Co. installed a broke beater with a 64-in. roll on the ground floor under the reel and winder.

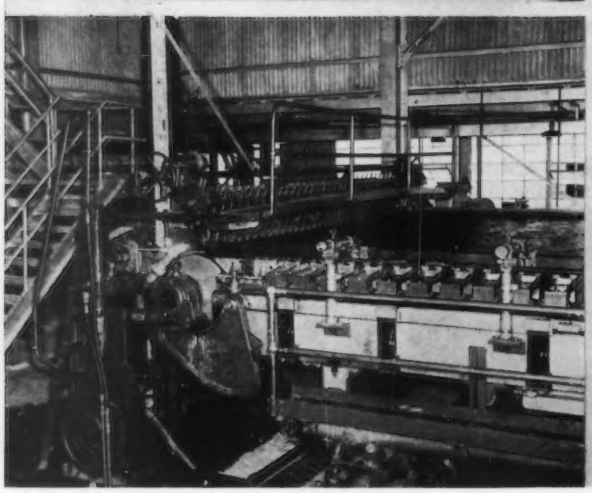
To provide space for the No. 4 machine and its auxiliary equipment, a building extension 44-ft. wide and 396-ft. long was added to the original ma-











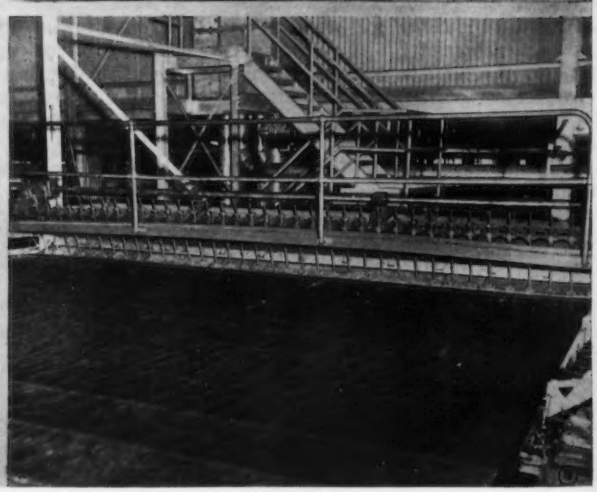


Figure 5—New Screen Room. Figure 6—Decker in Screen Room. Figure 7—Jordan Room at Head of Machine No. 4 Machine. Figure 8—Pusey-Jones Head Box on No. 4. Figure 9—Pressure Inlet on No. 4 Machine. Figure 10—Pulp Flowing Out on Fourdrinier from Slice at Wet End of the New Machine. Unlike Previous Installation, There Is No Head Box, the Pulp Being Forced Under Pressure by the Fan Pump Below.

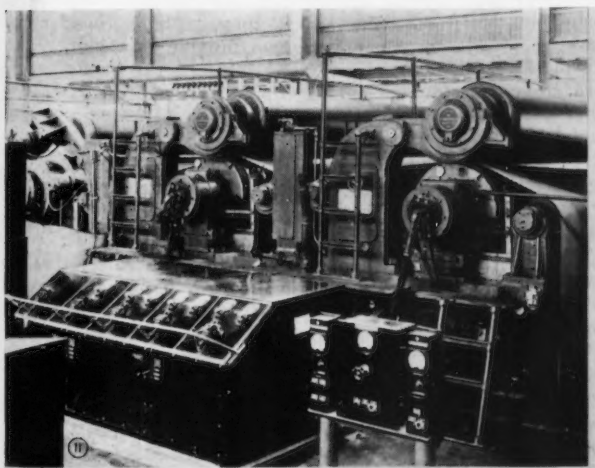
chine room building. This houses all of the added paper making equipment except the winder and unwinding equipment, which was placed in the extension to the finishing room, an added area of 44 by 144 ft.

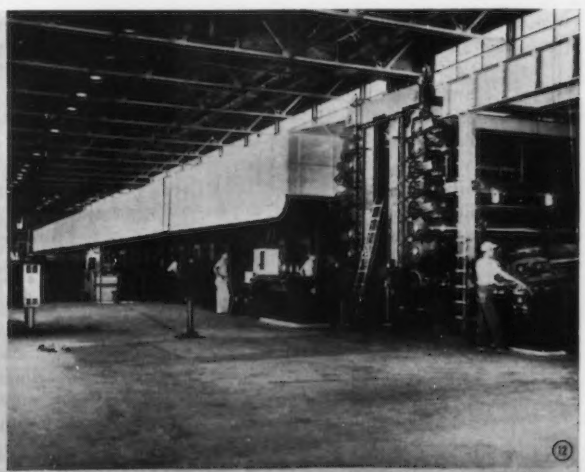
In the enlargement of its pulp mill, St. Regis added seven new digesters, each 10 ft. 6 in. dia. by 41 ft. long with 2700 cu. ft. of capacity, which were built by the Chicago Bridge & Iron Co. The digester building was extended to 26 ft. wide by 150 ft. long. Digesters are equipped with 8-in. stainless steel Yarway blow valves equipped with cylinder for hydraulic operation. The chip bins above the digesters were extended and an additional belt conveyor was provided by the Jeffrey Mfg. Co., which also furnished discharge gates of clam-shell type at the chip bin hoppers for filling the digesters with chips. An additional blow tank and digester blow heat recovery unit, now being installed, will be completed by the end of the year and will provide more flexibility in cooking operations and minimize down time.

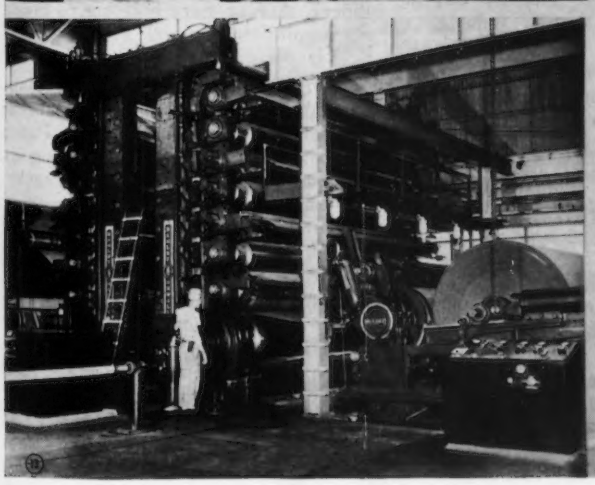
An extension of the washer room, 40 ft. wide by 98 ft. long, was built to provide for an Impco brown stock washing system, which consists of three 8 ft. by 12 ft. washers, with repulpers and a vibratory de-knotter. The Chicago Bridge & Iron Co. built and installed three 30-ft. dia. by 20 ft. steel tanks for storage of black liquor from the washers and one 20 ft. dia. by 35 ft. high steel foam tank, which are on the ground in the area adjoining the washer room extension. These tanks and vessels are mastic coated supplied by Insul Mastic Corp. of America, applied by Snook and Fletcher. The J. O. Ross Engineering Corp. furnished the washer hood and exhaust system. The Bristol Co. supplied instrumentation and control for the brown stock washing installation.

The screen room building was also enlarged, an extension 72 ft. wide by 90 ft. long providing space for 16 Impco four-plate bronze vat, flat screens, arranged in eight lines of two screens per line, and two 8-ft. dia. by 8-ft. wide Impco vacuum deckers with repulpers. A DeZurik pan type consistency regulating unit is used. To provide for storage and handling of thickened stock from the screens and the stock from the washers, two concrete stock chests are located on the ground floor, one in the screen room and one in the washer room. These are horizontal, mid-feather lined type, each equipped with two horizontal propeller type agitators.

An extension, 71 ft. wide by 110 ft. long, to the stock preparation building provides the additional space required for new refining equipment, which is on the operating floor level, with the stock chests, pumps, agitator drives, etc., on the ground floor below, The new refiners are arranged in two lines, each consisting of two No. 3 Claflin refiners and four No. 5 Miami Jordans, which are hooked to piping to provide a two-circuit flow of stock







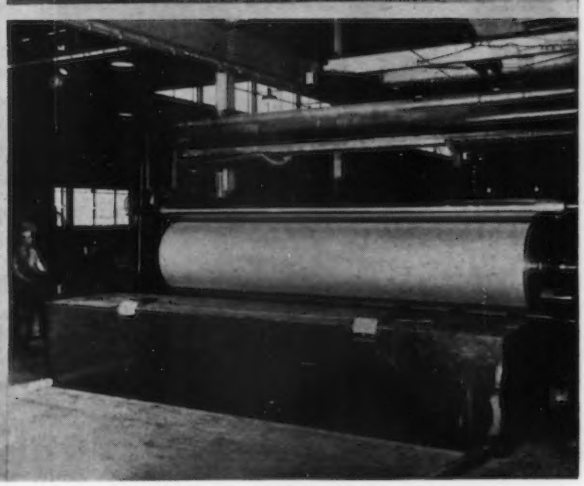


Figure 11—Presses and Controls (Console) View from Dry to Wet End. Figure 12—New No. 4 Bagley and Sewall Paper Machine, As Shown from the Dry End. Figure 13—Calender Stacks with Reel of Paper Ready for Transfer to the Rewinder. Figure 14—Rewinder of the New No. 4 Machine, Showing Roll Elevator.

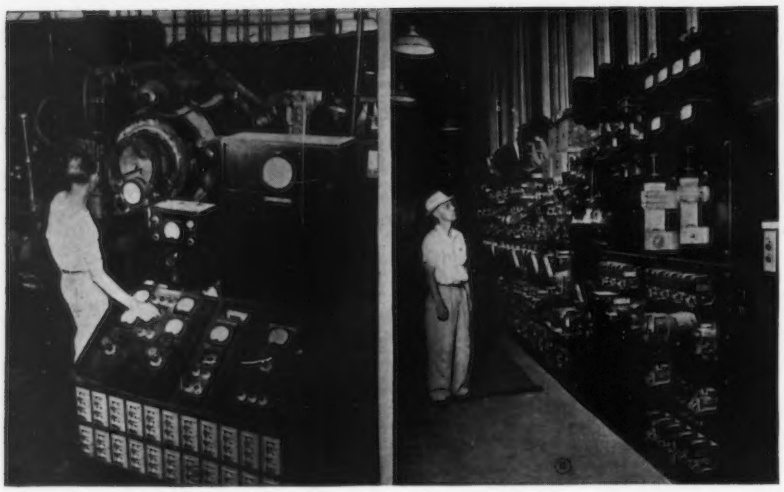


Figure 15—Machine Tender's Control Panel at Wet End of Machine. Figure 16—View of Master Control Room Situated on Level Below Machine Floor.

from chests for a primary and secondary refining and a finishing treatment, flowing direct to the paper machine regulating head box. Individual drive is by Westinghouse 350 hp., 400 rpm. synchronous motors. Other equipment in the refining department includes an 8-ft. by 12-ft. Impco Vacuum Save-All, two Trimbey heavy density pump-type consistency regulators, pumps by Goulds Pumps, Inc., and three concrete stock chests, made by the Shartle Brothers Machine Co., lined with Semplate tile by the Stebbins Engineering & Mfg. Co. Semplate tile linings were also added to the concrete stock chests and pits that were a part of the mill's original equipment.

Additional steel supports were erected to provide an additional space of 18 ft. by 80 ft. in the evaporator building, in which a sextuple effect, vertical type black liquor evaporator, made by the Swenson Evaporator Co., was installed. An addition, 80 ft. by 80 ft., was built ajacent to the original recovery unit installation to house two Tomlinson black liquor recovery units, with automatic soot blowing equipment, separately fired superheaters and cyclone evaporators, furnished by the Babcock & Wilcox Co. These were similar to the units originally installed except for larger dimensions and rated capacity. The Koppers Co. furnished an electrostatic precipitator for dust recovery from the gases of the new recovery units. It is located alongside a similar unit added to the mill since it was originally built, and is expected to abate air pollution and afford economies in the recovery of chemicals.

The Dorr Co. supplied the causticizing reaction tanks, green liquor and white liquor clarifiers and mud washing and thickening tanks with pumps and auxiliary equipment for the causticizing and liquor making plant, duplicating the original installation of such equipment. The lime slaker originally installed was replaced by one of larger size. Additional steel tanks were erected for white liquor storage and sludge handling.

A new lime reburning kiln, 8 ft. dia. by 140 ft. long, is provided with a firing hood for either gas or oil firing and is fed by dry mud from an Oliver mud filter, 6 ft. dia. by 4 ft. It is similar to the one originally installed and was furnished by the Vulcan Iron Works. A Rotoclone unit, product of the American Air Filter Co., has been installed at the gas discharge ends of each kiln to recover dust from the gases. This is expected not only to increase output of the kilns, but to aid in smoke abatement.

The steam power plant has been enlarged by the addition of an integral furnace boiler, natural gas fired, 140,000 lb. per hr. capacity of 400 lb. steam, furnished by the Babcock & Wilcox Co. This has been installed in a 40 ft. by 60 ft. extension of the original boiler house. Each of the boilers of the two recovery units is expected to produce 61,000 lb. per hr. of 400 lb. waste heat produced steam in addition to the regular steam production. A. B. & W. bark burning boiler of the Sterling type, 400 lb. design, 50,000 lb. of steam capacity per hr., will be fed the bark and refuse from the wood handling and chipping operations by a belt conveyor from the barking drums and other points of origin. This refuse goes to a steel bin with screw feeders, built by the Hofft Co., which is situated over the dutch oven of the boiler. Between the furnace gas outlet and the induced draft fan for precipitation of the dust and solid particles in the gases a fly ash and soot collector, made by the Buell Engineering Co., has been placed in a further effort to abate smoke.

The original electric power plant has been extended by a new building 40 by 100 ft. to house the new electric equipment, consisting of two 5000 kw., 2300 volt, a. c., 80 per cent P.E., Westinghouse turbine generators and the electric feeder distribution switch gear. Each unit is designed for operation with steam at 400 lb. gauge and a total temperature of 600 deg. Fahr. One unit is arranged for extraction of 50 lb. gauge steam and the other for 150 lbs. Electric power is distributed at 2300 volts through feeder cables to the starting controls of all of the 2200 volt motors (75 hp. and above) and to several 1000 kva air transformer power centers, from which the 440 volt distribution feeders are run to the various motor control centers.

Buildings still under construction to be completed late this year include a building 55 ft. by 72 ft. for housing two roll grinders and to provide storage space for rolls; a paper roll storage building, 120 ft. wide clear span by 438 ft. long, with overhead crane runways to provide for storage of paper rolls between the paper supply and bag operations, and an extension, 360 ft. wide by 144 ft. long, to the bag plant. This extension of the bag plant will increase its capacity 35 per cent when it is completed at the end of the year.

There is also under construction an engineering department wing of 12,800 sq. ft., which will be devoted to the development of bag-making machines for company plants and licensees both foreign and domestic. This department comes under the supervision of E. E. Burroughs Sr., chief engineer of the multiwall bag engineering division, with Harry E. Lee assistant chief engineer. A four-story building to house all administrative and acounting offices is also under way.

In the enlargement of this plant and construction of the new plant at Jacksonville, Fla., the St. Regis Paper Co. has aimed mainly at increasing its production of multiwall shipping sacks, for which demand has been increasing at a rapid rate, estimated at two and a half billion sacks last year for the entire industry as against less than half a billion in 1938. Although the multiwall container came into use about 25 years ago, it was originally used mainly for cement and other rock products, later by the sugar industry, and more recently by a wide variety of industries, many of which have substituted it for steel drums, fibre drums, wooden barrels, boxes and fabric bags. A considerable part of the present output goes to the fertilizer industry and

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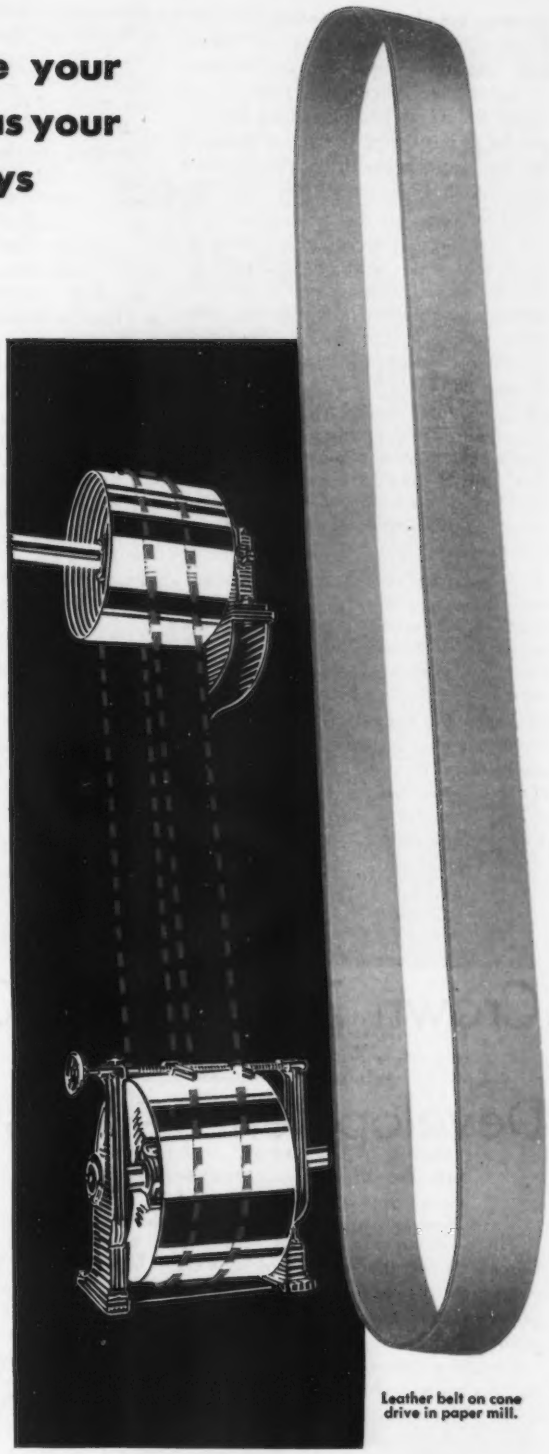

Leather belt on cone drive in paper mill.

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its use has been increasing for the packing of livestock feeds, for chemicals and for flour. The development of valve bag packaging systems, in which St. Regis has played an important role, has been partly responsible for the rapid growth in demand for multiwall bags.

Carved out of the wilderness only ten years ago, the village of Cantonment, where the St. Regis "Kraft Center" is located, has become a self-contained community in which the company and the employees themselves have established an industrial community life along modern concepts of employer-employee relationships. There are about 250 one-story homes, originally built by the company, which are now mostly owned by the occupants. All homes built by the company are being sold to employes as rapidly as possible.

To provide recreation for workers and their families, the company has encouraged many projects, but the costs are defrayed by the Harvester Club, an association of all employees, which contributes about 98 per cent of the upkeep expenses besides administering to charity cases within the organization. Recreational projects include a nine-hole golf course, a children's playground and, an athletic field for baseball and soft ball. A considerable part of the sports activity is contributed by two boys' baseball leagues, the Little League for those from 9 to 12 years and a Pony League for players from 12 to 15 years.

From 200 to 300 employees and members of their families participate in spectator sports and spectator interest runs high. There are about 25 sports projects, including bowling, basketball, touch football, volley ball, etc. Intro-departmental contests are regularly staged.

The St. Regis Paper Co. takes pride in the fact that a credit union, owned and operated by employees and Federally supervised, has within four years of its inception acquired capital assets of $125,000 and has made loans aggregating $400,000.

Another successful project of the company in fostering community life is a 24-page tabloid newspaper published once a month, which through local advertising is on a self-sustaining basis.

Still another company project is an apprentice school for training employees for the mill and bag plant. From about 400 employees some years ago, the company now has 2300, not including about 1000 workers in its woodlands. The company owns some 300,000 acres of woodlands in the Florida, Alabama and Mississippi area and has long-term cutting rights on a tract in Georgia of 208,000 acres. To this acreage has recently been added 47,000 acres in Florida near the Georgia property. These forest areas serve as a backlog to the company's operations, a high ratio of the current pulpwood supply coming from private woodlands owners within a 100 to 150 mile radius of the mill.

The company operates the largest privately-owned slash pine nursery in the industry, named the Jack Lawton Nursery after its first manager. A 10-acre tract close to the mill will grow some 10,000,000 seedlings this year. At least a million of these will be furnished without charge to farmers and small woodlands owners with whom the company deals in its procurement program. The manager of the woodlands division is J. M. Brewster.

George M. Snyder is resident manager of the company's pulp and paper mill at Pensacola. A. O. Mortenson is chief operating engineer; L. L. Clapp, technical director Kraft Division; Charlie Bodner is the manager of the Pensacola multiwall bag plant. Russel Seip is chief engineer at the Pensacola Pulp & Paper Mill.

W. J. Westbrook is the production manager of the Southern pulp and paper division which will include Jacksonville when completed.

Crown Zellerbach's Camas Mill Developments August 1951 to August 1952

The Crown Zellerbach Mill at Camas during the past 12 months has continued to progress in its long range improvement and development program.

Camas' outstanding single item was the dedication of the new half-million dollar Development Laboratory. This new unit, the most complete development laboratory to be established by a pulp and paper manufacturer, rounds out the facilities of the Crown Zellerbach Central Research Department. Built on a hillside overlooking the Camas Mill, the 15,000 square foot structure houses a complete pulp and paper-making plant from chipper to rewinder. In addition to the usual auxiliary such as rewinders, the Laboratory has a specially designed coating machine built by John Waldron Corporation with dryer by J. O. Ross Engineering Co. The machine is 50 feet long and can coat a 25-inch sheet at speeds up to 250 feet-per-minute.

Aside from the Development Laboratory, however, was the expenditure of nearly three and a half-million dollars, no great part of which was spent for any single major facility. Most of the work done and equipment installed was simply for making a good mill better.

Wood Mill and Chip Storage

Work was nearly completed on the small log side of the Wood Mill. Aside from minor adjustments on the Hansel Ring Barker, completion of the dry log-haul for truck delivered wood is all that remains to be done.

Ever-present problems of communication and supervisory control in the Wood Mill have been improved by the installation of intercom and public address systems at strategic points. For example, a logger on the river can now hear spoken instructions from the operator in the huge Berger crane high above the river, and the hydraulic barker operator has direct contact with the swing saw operator. VHF radio contact is maintained between the two mill tug boats working on the Columbia River raft storage grounds and the supervisor's office next to the Wood Mill. As one supervisor put it,

The tough, flexible film formed by Methocel (Dow methylcellulose) has proved valuable as an inside sizing of fiber cartons and drums to assure a clean, lint-free surface. This is particularly important in the packaging of pharmaceuticals, foods and other products where contamination from lint must be avoided.

Methocel has also solved the problem of providing fiber drums that are easily parted from solidified products such as asphalt, rubber and waxes. The addition of Methocel to the coating formulation applied to the container board assures dependable, effective parting.

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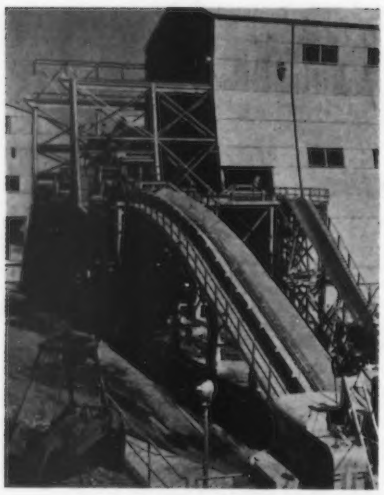


Figure 1—Log Haul to transport small logs received by truck and rail to Hansel Ring Barker.

"These operations are too big to be yelling instructions. The radio and speaker system has made my job much easier and pleasanter."

To move the increased volume of purchased chips, Crown Zellerbach made arrangements with three railroads for conversion of 200 box-cars to chip hauling service during the past year, making a total of 300 in service. Converted at Crown Zellerbach's expense, these cars are assigned to chip hauling between several Northwest lumber and plywood mills and the Camas Paper Mill.

To unload and move the increased chip receipts to storage, the capacity of the airveyor unloading unit was increased about 60 per cent. This was accomplished by adding another suction tube and speeding up the positive displacement air blower.

Pulp Mills

Both the Kraft and Sulfite Pulp Mills at Camas have been operating at top capacity, but in spite of heavy demands for all grades of pulp, considerable progress in replacing outmoded equipment has been made. In addition to the usual replacement of piping, valves and pumps, a new tank and a black liquor measuring tank were erected anticipating installation of a stationary kraft digester late in 1952.

The efficiency of No. 2 Tomlinson furnace was increased appreciably by the installation of Babcock & Wilcox superheater units.

The Kraft Mill reported completion of the new stock segregation system and high density storage tanks. Operating in connection with both Kraft and Sulfite Bleach Plants, this new system permits blending the kraft pulp grades presently produced with a high degree of control. Greater flexibility in programming both pulp and paper production will also be an important benefit.

Greatly increased demands for bleached pulps required replacement of the chlorine evaporator system with a larger unit of adequate capacity.

The Kamyr pulp dryer was overhauled completely with replacement of the cylinder. Wet machines were all fitted with new press rolls. Old lapped pulps shredding equipment was removed.

Beater Room

The principal addition to the beater room equipment and facilities has been a completely new liquid dark-size distribution system and a No. 4 Jones pulpmaster. The new system parallels the light-size system and permits efficient distribution of dark-size throughout the beater room for unbleached kraft grades.

The Jones pulpmaster has repulped as much as 219 air-dry tons of kraft laps in three shifts. Distribution of slush to any one of 7 storage chests is made through a manifold equipped with remotely controlled valves.

Paper Machines

While the year may be considered an uneventful one so far as major machine room changes and additions were concerned, machine crews voted the new ventilating system as the most important addition of the year. Improved ventilation has also reduced condensation and drip—especially during the winter months. As a result, Camas paper machines produced more top quality paper free from damage due to these indoor rain storms.

Replacement of journals with antifriction type bearings has continued so that all machines operating at higher speeds are at least partially equipped.

No. 2 machine was equipped with new rectifier rolls in the headbox. While there has been no appreciable change in operating speeds, the sheet formation has been improved.

No. 8 was equipped with a new suction roll and pneumatic loading at the first press. Rearrangement of the wet end felt rolls and removal of the third press roll has made No. 8 machine safer and faster while producing a better sheet.

No. 10 machine's increased dryer temperatures have permitted higher speeds although no mechanical additions or changes were made. However, the design capacity of the Dirtecs was exceeded and installation of 4 more units was required.

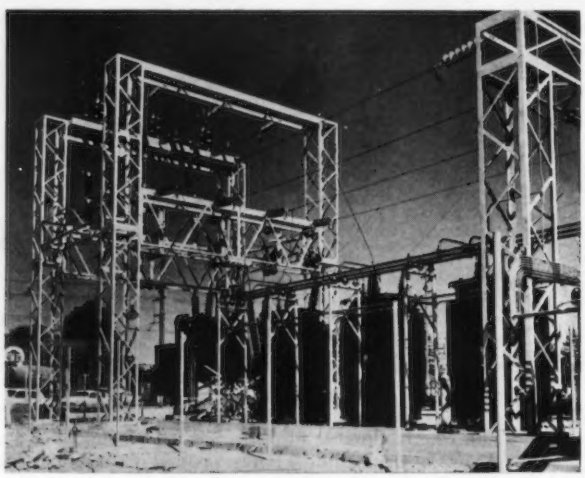


Figure 2—Six-thousand K.V.A. Sub-Station No. 5.

No. 14 machine's wire and clothing life have been increased appreciably as the direct result of the installation of selectifier type screens after the fan pump.

No. 15 machine had a problem when running certain grades; wrinkles formed after the sheet passed the sizing rolls. While the know-how of the machine tenders usually controlled the condition, the spectre of off-quality paper was ever present. Installation of a Mount Hope roll at the size press eliminated the wrinkle problem.

Finishing Departments

No. 1 Finishing Room (Rewinding) acquired a Cameron Model 14 Rewinder which can handle parent rolls up to 72 inches wide. A trim blower system was installed to deliver trim to the basement from the new ma-

chine, keeping the operating area free of broke carts and delivery pipes.

A roll counter-balance was installed on the dampener ahead of the supercalenders. This device will permit winding of dampened, lightweight sheets in roll diameters up to 33 inches. Danger of the roll flattening from its own weight has been eliminated.

No. 2 Finishing Room (Cutter and Trimming Section) acquired a new 130 inch Moore and White Duplex layboy cutter. This machine has a 30 roll back-sand, automatic tagger and has cut as much as 30 tons per shift.

This department is also awaiting delivery of an electric roll-grab truck to handle paper in and out of roll storage as well as servicing the cutter backstands.

Converting Plant

Equipment additions in the Converting Plant during the past twelve months included two continuous operating toilet rewinders. One, a Hudson Sharp machine, takes an 81 inch parent roll. The other, taking a smaller 63 inch roll was built by Paper Converting. Both machines operate continuously at constant speed. Rolls of uniform count are delivered and stripped from the rewind shaft automatically. The operation is continuous except for required stops to change parent rolls. Both of these automatic rewinders are delivering rolls of great uniformity with reduced waste and increased production.

Another Paper Converting Continuous Rewinder has been installed in the Wax Lunch Roll Department. This machine has replaced four single roll rewinders. Substantial savings have been made through increased production per man hour, and elimination of waste.

Since, 1946, the addition of new equipment and the resultant increased power usage has overtaxed existing facilities in the Converting Plant electrical subcenter. Conversion from 220 volts to 440 volts has been made to eliminate the overload on transformers and conductors.

Maintenance Department

Mill maintenance acquired two pieces of equipment not often found in paper mills; one, a Magnaflux machine for inspecting metallic machine components for invisible flaws; the other, a lathe with a swing radius of 44 inches. Although in service only a few months, the Magnaflux machine used by the Maintenance Control group has found a number of potentially dangerous defects during routine inspections.

Cracks were discovered in pressure roll and reel journals. Acid tank welds were inspected for soundness and defects spotted. Castings that passed a visual check were Magnafluxed and found to have blow holes and shrinkage cracks. A number of dryer heads were checked and one removed from service because of sub-surface defects.

Timely discovery of these flaws undoubtedly averted unscheduled machine downtime and eliminated a whole group of accidents that were just waiting to happen.

Power

Making more paper means using more power; using more power has made the construction of sub-station No. 5 necessary. Now nearly completed, this 600 KVA station will service the Converting Plant section of the Mill. Also, since August 1951, new electrical switch gear and controls have been installed on Nos. 1 and 2 paper machines, and in the Kraft Beater and Wet Rooms.

Yard Department

The Yard Department continued on its program of improvement and replacement. During the past 12 months nearly a mile of roadways have been paved, the sulfur and fuel oil unloading dock has been rebuilt and the old sulfur conveyor trestle torn down and replaced with a new structure.

Three new parking areas were constructed to accommodate the cars of employees. Two of these were outside the Mill and the third was in the vacinity of the New Wood Mill.

Safety

Increased production and lower unit costs are not the only benefits of the equipment modernization program. An indirect, but very important benefit has been a continuous decrease in the lost time accident frequency. Camas Mill Safety Department is currently reporting a frequency rate of 2.17 for the calendar year-to-date. This is significantly lower than the 3.67 reported for 1951, and far below the frequency rate of 12.2 prevailing five years ago.

Modernization and expansion in a Mill as large as Camas is a long range program; in fact, one that is never done. It started in 1884 when the Camas Mill operated as the Columbia River Paper Co. and continued up to the present. Already scheduled for the next 12 months is an expenditure of more than $1,600,000 in increase production and improve products. This will be spent for rearrangement of equipment and modernization of some operations.

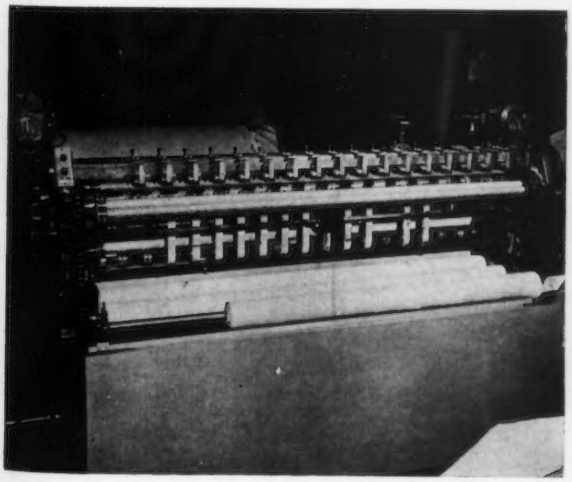


Figure 3—Eighty-one inch Hudson Sharp continuous toilet tissue rewinder.

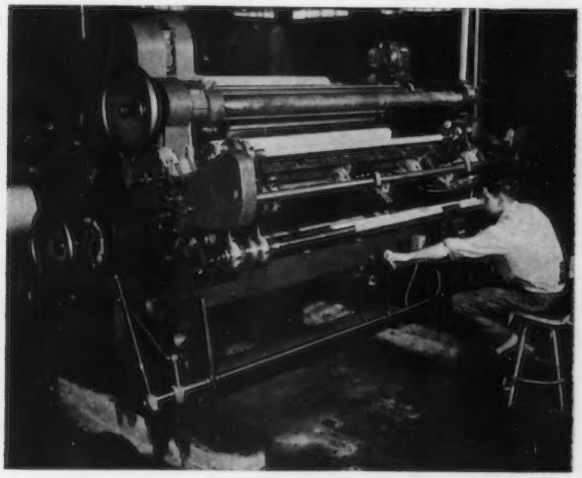
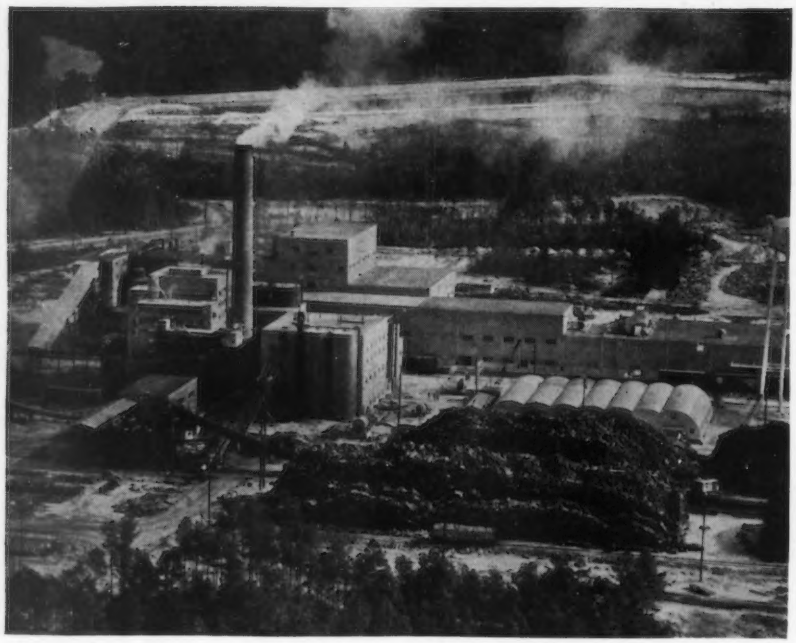


Figure 4—Automatic wax lunch roll rewinder built by Paper Converting Machine Co.

Riegel Carolina Corp.



Aerial View

Most Modern Kraft Pulp Mill

The newest and most modern kraft pulp mill in the U. S. went into regular production shortly before the beginning of the year 1952, after making the first trial runs on December 20, 1951.

Reigel Paper Co. purchased 140,000 acres of timberland near Acme, N. C., in 1937.

Since it was founded in 1862 by John Leidy Riegel at Finesville, N. J., the company had grown to an organization of four paper mills containing bleach plants, 13 paper machines and converting equipment. The paper mills are located at Milford, Hughesville, Reigelsville and Warren Glen, all in New Jersey.

These four mills produced over 100,000 tons of paper in 1951. All of the Riegel products are high grade specialties including glassine, plain, waxed and lacquered, carbon coating base, greaseproof, manifold, tympan, cover, pressboard, drawing, bristol, tag, folder and latex and resin impregnated papers.

Location

The new pulp mill is situated on the Cape Fear River, near the small village of Acme, about 20 miles west of Wilmington, N. C. The mill is served by both the Atlantic Coast Line and the Seaboard Railroads. The Cape Fear River is navigable and offers a second means for transportation of raw materials and finished products to and from the mill.

Wood Supply

Estimated wood requirements for the mill are 150,000 cords per year. Pulpwood procurement operations extend to a radius of 100 miles. This encompasses an area having an annual growth of 2½ million cords, of which about 60 per cent is pine and 40 per cent hardwoods. Three woodyards have been established at strategic locations in the more distant areas for the purchase of pulpwood. The amount of company owned land is being constantly increased at a slow but steady rate.

Wood Handling

The woodyard at the mill holds about 12,000 cords of pulpwood. The present average usage is about 450 cords per day and the average daily receipts will, of necessity, balance the usage.

Wood delivered by truck is about 5½ ft. long whereas the wood delivery by rail may be either 5 ft. or 5¼ ft. long. Straight wood up to 17 inches diameter may be handled without splitting. Crooked or knotty material or bolts more than 17 inches diameter are sent to a small sawmill adjacent to the barking drums. Approximately 70 per cent of the wood is brought in by rail and 30 per cent by truck.

A pair of P & H Crawler type cranes equipped with 70 ft. and 80 ft. booms are used to transfer wood from the railroad cars or trucks either to storage or to the Link-Belt chain conveyor leading up to the barking drums. Both cranes are equipped with Owens "orange peel" grapples but a clam shell grapple is also available.

The conveyor is really two separate conveyors. One is entirely horizontal and feeds the other which is sloped for part of its length to lead up to the barking drums.

The two barking drums which were built by Fibre Making Process Co. are each 12 ft. diameter by 45 ft. long. These drums are both chain suspended and are identical except that one is designed to be operated wet, when hardwood is being used. The other drum is

Ward D. Harrison, Vice-Pres.-Prod.

C. E. Hartford, Vice-President, and Mill Manager; R. C. Passmore, Assistant Secretary; R. O. Halverson, Purchasing Agent; J. D. Dailey, Production Manager.

R. H. Aranow, Personnel Manager

Walter C. Ashworth, Personnel Assistant; C. E. Roth, Pulp Mill Superintendent; J. D. Rhodes, Maintenance Superintendent; A. R. McBeth, Woodyard Superintendent; H. R. Arnold, Plant Engineer; C. C. Peters, Assistant Plant Engineer.

operated dry at all times and both are used dry when pine only is being handled.

Wood from the barking drums falls from the discharge end on to an 11 strand sorting chain conveyor, which carries it to the chipper, or allows it to be pulled off to the reject conveyor. The reject conveyor is used to return incompletely barked wood to the drums.

The chipper was built by D. J. Murray Co. and has an 88 inch diameter disc equipped with 10 knives. It is driven by a wound rotor induction motor through a multi-V belt drive. Chips discharge to a belt conveyor that carries them to a hopper over the two Orville Simpson Rotex inclined chip screens. Oversize rejects from the chip screens are carried on a Link-Belt conveyor to the rechipper which was built by Carthage Machine Co. and is equipped with a 10 knife 34 inch disc.

Accepted chips from the screens are carried on a belt conveyor to the bucket elevator. The bucket elevator is equipped with a belt to which are attached two rows of buckets.

The bucket elevator feeds a conveyor which extends across the tops of two chip storage silos. Adjustable baffles direct the chips into the proper silo. The silos are tile and were constructed by Stebbins Engineering Co. Each silo has a usable volume of 26,000 cu. ft. and is equipped with an apron feeder which removes chips at the bottom and transfers them to a rubber conveyor belt that carries them up to the digesters.

Waste material from the wood preparation system is all collected and burned in a refuse furnace. Bark from each barking drum is carried on a drag chain conveyor to a belt conveyor which in turn carries it to a hog at a maximum rate of 18 tons per hour.

The hog was built by Diamond Iron Works. Bark from the hog is carried on a belt conveyor up to a bark storage bin above the refuse furnace in the boiler room.

The conveyor which carries chips from the feeders up to the digesters is equipped with a weightometer which accurately records the weight of each digester charge.

A Dings magnetic separator, suspended over this conveyor belt removes tramp iron from the chips before they enter the digesters.

Chips are removed from the moving belt into the proper digester by a Link-Belt tripper.

Digester

There are six digesters in operation. Five digesters were built by Graver Tank Co. from Lukens Stainless Clad Steel. The cladding is ⅛ inch number 316 Columbian stabilized stainless on ⅝ inch firebox steel base. Number six digester was built by Chicago Bridge & Iron Co. of "Rimming" steel. All of the digesters are the same size, being 11 ft. 6 inches inside dia. and 43 ft. overall height, with a straight side height of 24½ ft. All are insulated with 2½ inch thick magnesia block.

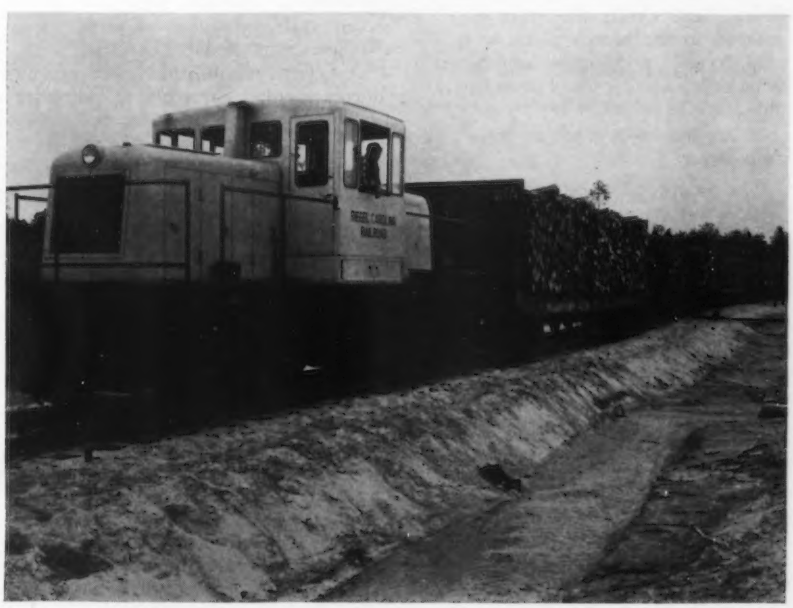
Direct steam cooking is used, but all digesters are equipped with Fibre Making Process Co. circulation pumps and screens. Cooking may be manual or completely automatic with Foxboro control and recording systems.

The system was also designed so that one or two of the digesters may be used for the production of semi-chemical pulp using neutral sulfite or kraft cooking liquor. For this reason there are two separate blow tanks, and the washing, screening and stock storage equipment may be divided into two separate systems simultaneously.

Each blow tank is 24 ft. in diameter with an overall height of 56 ft. Each is equipped with an Impco agitator and torque type consistency regulator. A Foster-Wheeler blow heat condenser and accumulator is connected to both blow tanks.

Stock from the kraft blow tank is pumped to the Impco brown stock vacuum washing system. The first unit of this system is a twin basket vibratory knotter screen, from which the accepted stock flows directly to the vat of the first washer. There are four of these vacuum washers each having cylinders 8 ft. diameter by 10 ft. long. These washers may be used as one four-stage washing system for kraft pulp or the first three may be used as a three-stage system for kraft with number four being used as a single stage washer for the secondary system.

However, the semi-chemical pulp,



G.E. Diesel locomotive pulling a trainload of pulpwood at Riegel Carolina.

Rome Lytton, Design Engineer; C. S. Ruark, Chemical Engineer; J. R. Wright, Area Chemical Engineer; E. W. Bartholow, Jr., Area Chemical Engineer; V. B. Bodenheimer, Area Chemical Engineer; R. H. Reynolds, Plant Electrician.

when it is being made, is pumped from its blow tank through a pair of Bauer double disc refiners before going to the washer. A magnetic separator is located in the chute leading to each refiner.

Stock from the screens flows to two the two washed stock chests which may be used separately, one for kraft and one for semi-chemical, or they are both available for kraft. These are tile chests and are equipped with propellor agitators.

From the above chests, the stocks are pumped to the battery of 13 lines of Impco flat screens, six being single screens each having 14 bronze plates. The other seven lines are double screens with 28 plates each. All have Dunbar drives. The system was designed to allow almost any type of arrangement of the screens.

Stock from the screens flows two two Impco valveless deckers. These deckers may also be used separately for kraft and semi-chemical, or together for kraft. From the deckers the stock passes through DeZurik consistency regulators where it is adjusted to 3½-4 per cent consistency before flowing into one of the two screened stock chests. From these chests the stock may be pumped to the bleach plant or to the pulp dryer, depending on whether it is to be shipped as bleached or unbleached pulp.

Pulp Dryer

The pulp dryer consists of an Impco feltless wet machine followed by a Ross Dryer section, a Moore and White rotary cutter, a Matthews Layboy and sheet conveyor and a Baldwin baling press.

This equipment up to and including the rotary cutter is driven by a G.E. electric drive. The stock and dilution water is pumped to the wet machine after careful mixing in an Ingersoll Rand vertical pump.

The vacuum cylinder is 8 ft. diameter by 160 inches long.

The sheet of pulp is couched from the cylinder by a doctor roll and passes to the first press and then goes over two dryers and then passes to the second press. Both presses are hydraulically loaded. The sheet then passes through

A. L. Wiley, Process Cont. Supr.

R. L. Peason, Instrument Foreman

a pair of pull rolls as it enters the top of the Ross dryer. The wet end is one floor above the other parts of the machine so that it is even with the top of the Ross dryer.

The Ross dryer is 146 ft. long and handles a sheet of pulp 154 inches wide. The pulp travels the full length of the dryer in nine passes. Each trip is made on a lower level so the dry sheet emerges from the bottom at the dry end. During its travels the sheet is carried on nine conveyors. Automatic take-ups maintain correct chain tension.

Drying of the sheet is accomplished entirely by hot air. This air is heated by passing through rows of finned steam coils. Air flow is produced by 40 Sturtevant Axial flow fans.

Air flow within the dryer is conducted counter-currently to the direction of sheet travel so that the hottest and dryest air contacts the web in its dryest condition. The moisture laden air is exhausted into a Ross Briner Economizer.

The multiple effect economizer cools the dryer exhaust, using part of the heat to preheat the fresh air entering the dryer, the balance of the heat being utilized for heating water for use in stock dilution or pulp washing.

The entire dryer system is contained in an enclosure made up of tongue and groove steel panels with a 3 inch filling of rock wool insulation.

The housing is equipped with doors at strategic locations to provide access to the sheet as well as to the internal equipment. All electric motors are located outside the housing, with the shafts of fan and conveyor drive motors extending through the enclosure walls to the interior.

As the sheet leaves the dryer it passes to the Moore and White rotary slitter and cutter where it is cut into standard bale size sheets.

A Mathews layboy receives and stacks the sheets as they are ejected from the cutter. The sheets are removed from the layboy to the Mathews roller conveyor, in piles equivalent to a bale, and moved along the conveyor to the Baldwin baling press. Each bale is compressed with a force of up to 600 tons, before being covered with a pulp wrapper and fastened with wire ties.

The bales are weighed on a Toledo scale and carried by lift truck to the adjacent loading platform or to storage.

A Kamyr wet machine, trimming 130 inches, provides additional pulp handling capacity. This machine is equipped with a rotary slitter and cutter. The Mathews layboy and conveyor system is similar to that on the Ross dryer. The conveyors of both machines join together to carry sheet stacks from either machine to the baling press.

Chemical Make-Up Plant

Before describing the pulp bleaching operation we may well turn our attention to the chemical make-up department, which prepares the various bleach liquors, as well as neutral sulfite cooking liquor for semi-chemical cooking.

Liquid chlorine arrives at the plant in tank cars. For use in the direct chlorination, first stage bleaching, it is vaporized to a gas before being mixed with pulp and water.

Hypochlorite bleach liquor is made in this plant as calcium hypochlorite. This liquor is made by bubbling chlorine gas into milk of lime.

Neutral Sulfite cooking liquor is made by absorbing sulfur dioxide in a solution of sodium carbonte. The SO_2 gas is made in Acme sulphur burner at the chemical plant. This burner also supplies SO_2 for a weak solution which is sometimes used for a final bleached pulp wash.

A most important part of the chemical plant is that part devoted to the production of chlorine dioxide.

This plant was proposed by the Solvay Process Co. and its initial opera-

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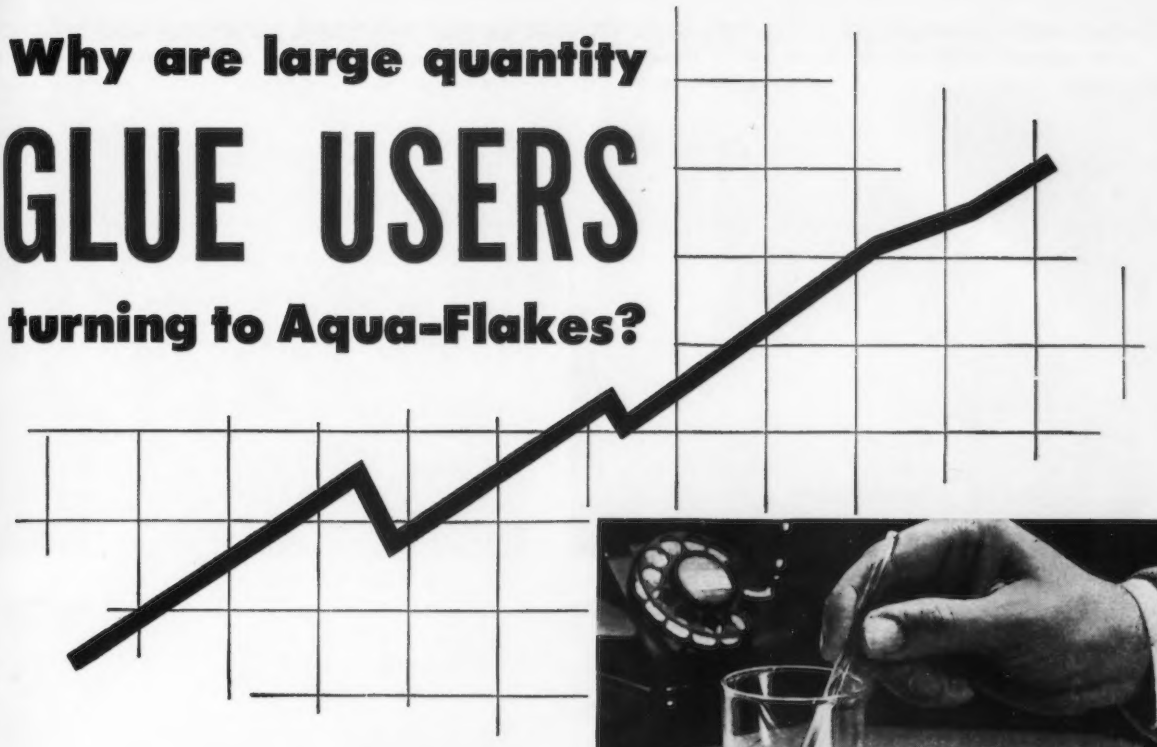

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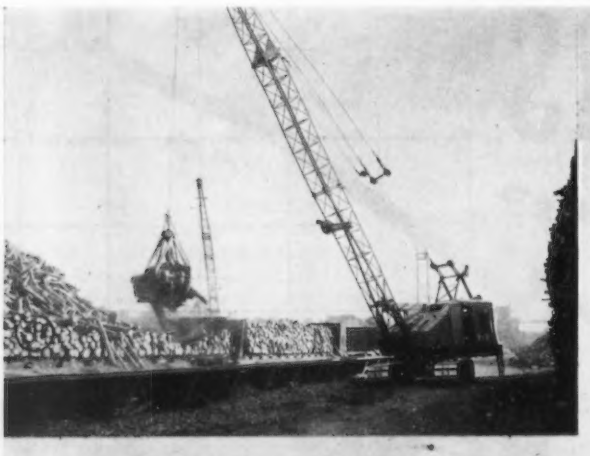
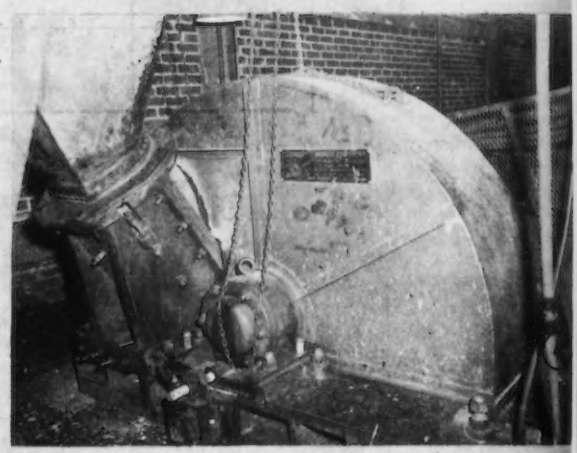
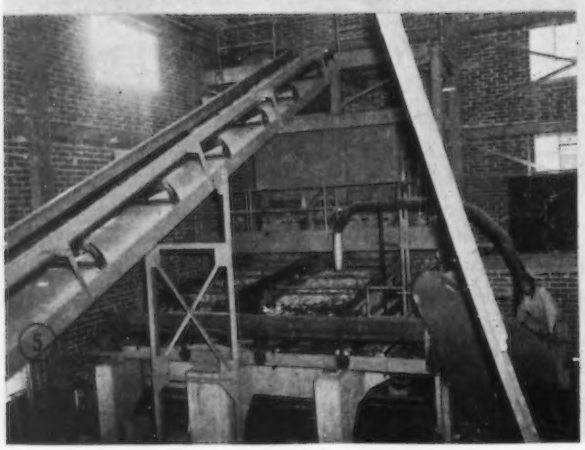
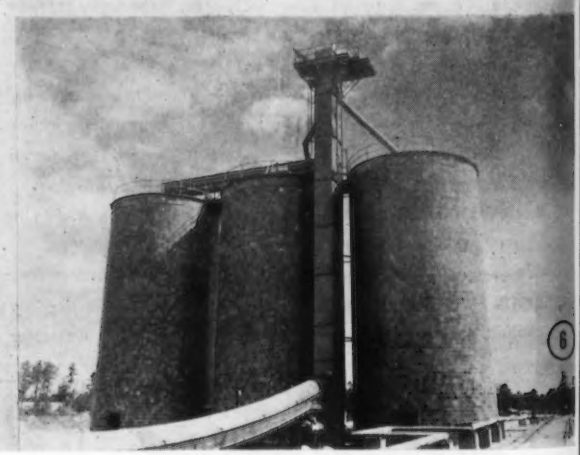
Figure 1—P&H Crawler crane picking up load of pulpwood with orange peel grab. Figure 2—Side view of barking drums. Figure 3—View of the pulpwood sorting conveyor. Figure 4—D. J. Murray chipper. Figure 5—Conveyor carrying chips of Hopper feeding into two Rotex chip screens. Figure 6—Chip storage silos.









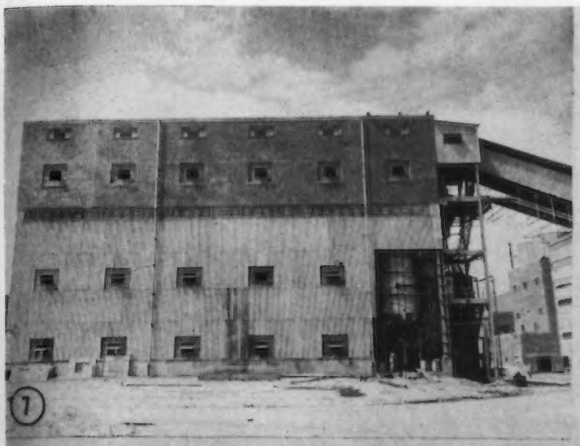
tion was supervised by a group of Solvay engineers and technicians headed by John Schuber. Although the production details have not been released for publication the process consists of the reduction of a chlorate to chlorine dioxide. The basic raw materials are sodium chlorate, methyl alcohol and sulfuric acid.

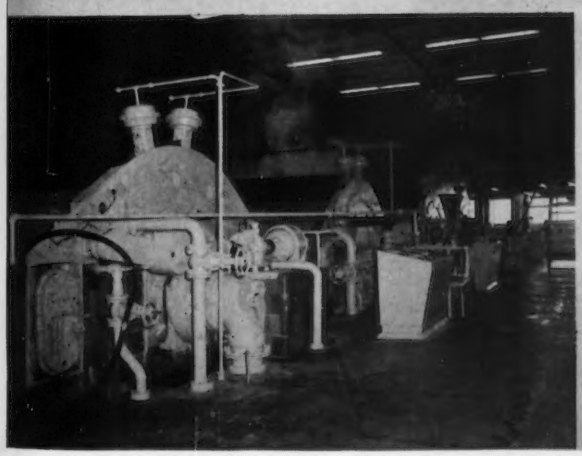
Bleaching System

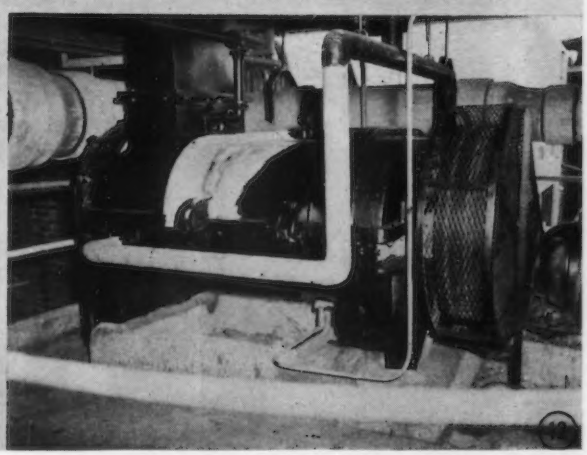
The bleach plant has six stages and was designed for a production of 200 tons per day. The six bleach towers are made of steel with tile linings in five of them and an acid-proof brick lining in the sixth.

Impco double-shaft mixers are used for blending the pulp and chemicals at the beginning of each stage of bleaching.

Figure 7—Side of digester building. Figure 8—View of the digester operating floor. Figure 9—Blow tank and digester building. Figure 10—Brown washers. Figure 11—Bleach plant vacuum washers. Figure 12—Impco Shaft Mixer in the Bleach Plant.







Six Impco vacuum washers are used to wash the pulp after the six stages. All have cylinders 8 ft. diameter by 10 ft. long. All cylinder vats were built of tile.

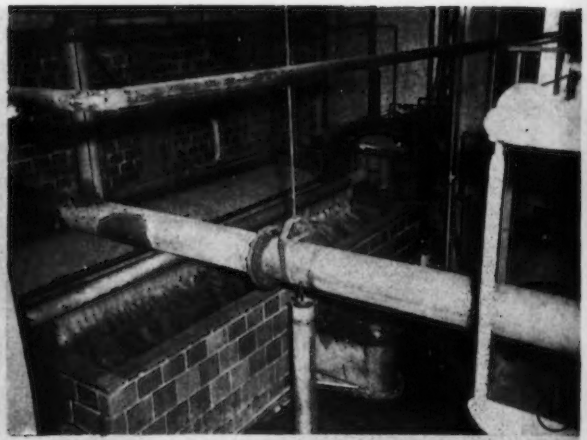
All controls and recording instruments for the bleach plant are centered on a panel in a glass enclosed room at one end of the washer floor.

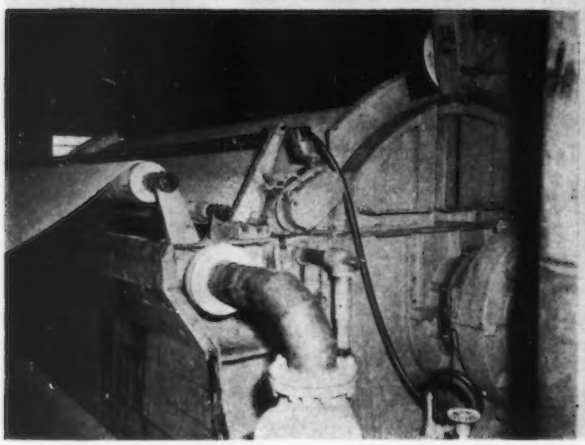
Stock for bleaching is pumped from one of the screened stock chests through a DeZurik consistency regulator and an Impco stock meter to the six stage bleach plant. The washed, fully bleached pulp flows from the last washer into the bleached stock chest from where it is pumped to the pulp dryer.

Recovery System

The recovery systems of modern kraft mills have become fairly well standardized. Black liquor recovered in the counter-current vacuum washing system is pumped from the washer seal tanks to black liquor storage tanks, equipped with an Impco foam breaker.

The six-body, six-effect, Goslin-Bir-





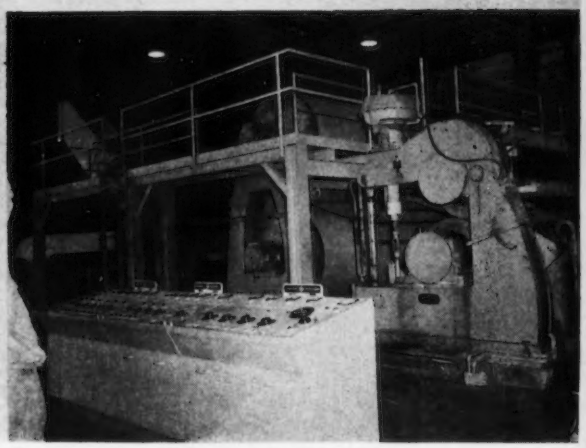


Figure 13—Another view of screen room showing control panel. Figure 14—Pair of Impco valveless deckers. Figure 15—Vacuum cylinder mold of Impco feltless wet machine which forms pulp sheet for drying in the J. O. Ross dryer. Figure 16—Console control in front of press section of Impco wet machine.

Figure 17—General view of Ross pulp dryer.

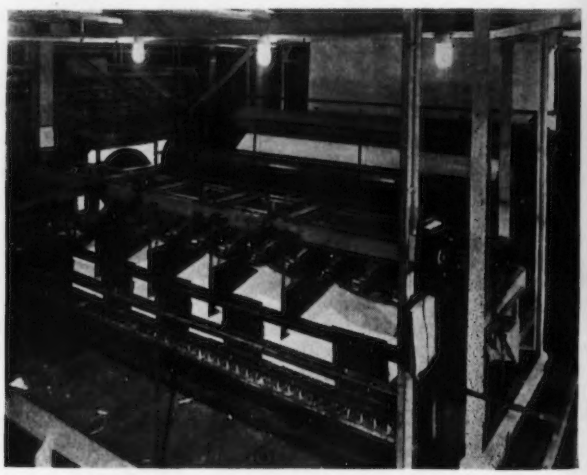


Figure 18—Mathews layboy collecting sheets of pulp at dry end of dryer.

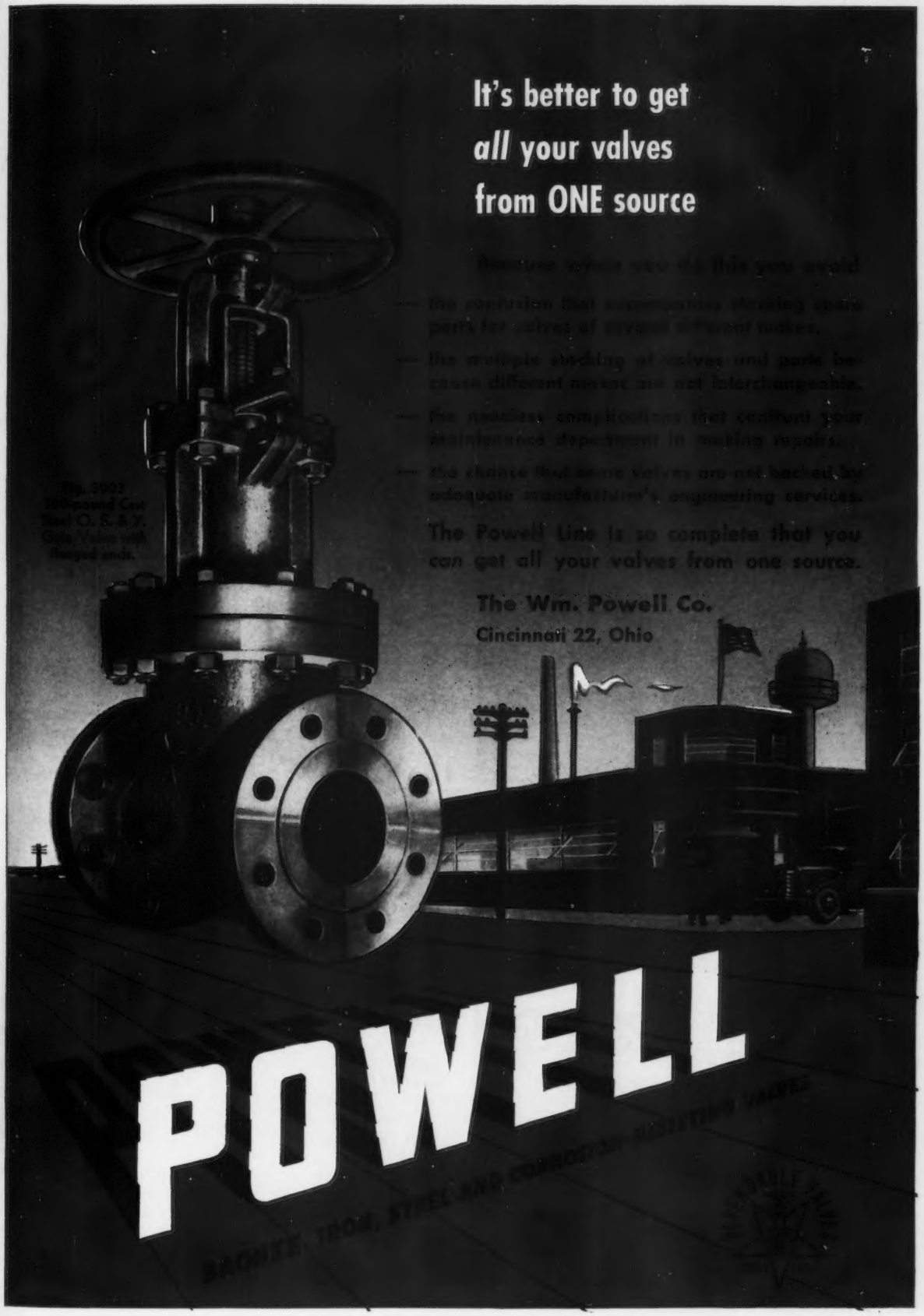

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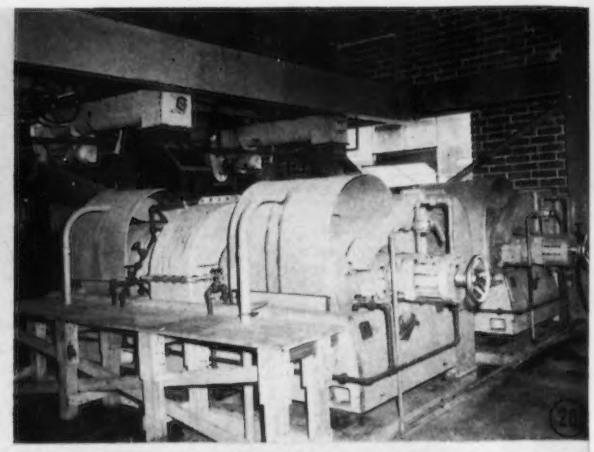
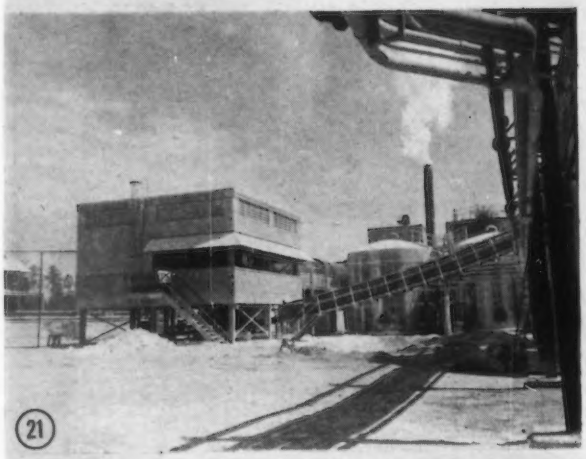
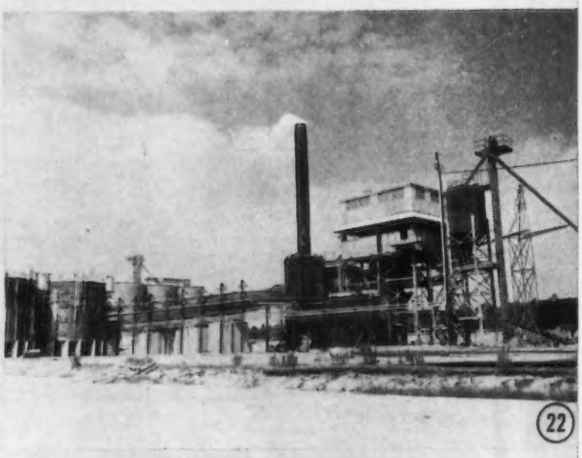
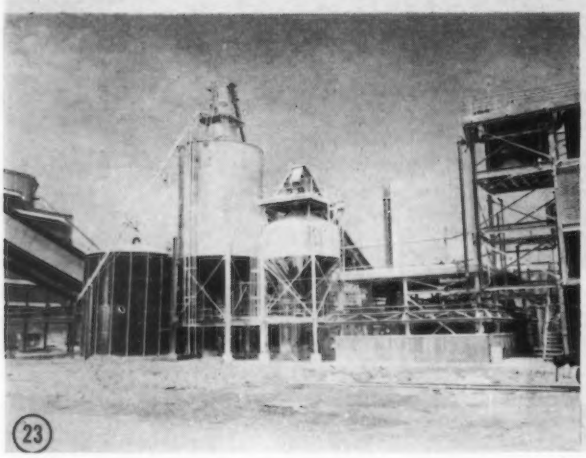
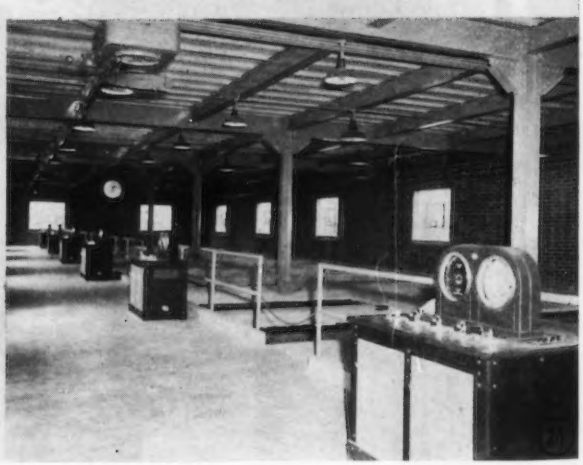
Figure 19—Baldwin baling press. Figure 20—Bauer refiners for treating semi-chemical pulp. Figure 21—Burner end of lime kiln. Figure 22—Wet end of lime kiln showing scrubber and exhaust stack. Figure 23—Part of Dorr liquor making system. Figure 24—Operating floor of filter plant.











mingham evaporator system receives the black liquor at 16 per cent solids and discharges it at 55 per cent solids, to the black liquor storage tank. This liquor is then pumped to the tank at the bottom of the Research Corp. wet-bottom precipitator. The wet-bottom type of precipitator is a new type in which the recovered material is dissolved directly in black liquor at the bottom of the precipitator instead of collecting it dry, and transporting it to the mixing tank.

The precipitator has a capacity for cleaning 112,000 cu. ft. of gas per minute.

A large sweep arm agitator keeps all solids suspended in the liquor as it passes through this tank to continuously receive the recovered salt cake as it is rapped from the precipitator curtains. The liquor then flows to the mixing tank where additional make-up salt cake is added and it is then pumped

Figure 25—Homomix unit.

Figure 26—Railroad siding and loading platform.

from this tank to the D. J. Murray cascade evaporator. Here the solids are increased to about 65 per cent before the liquor is sprayed into the furnace.

The recovery furnace was designed to burn a maximum of 16 tons of black liquor solids per hour in a 60 per cent solution. Rated steam production is approximately 100,000 lbs. per hour at 625 psi 725°F.

Smelt from the recovery furnace drops continually into the dissolving tank where it is dissolved in weak liquor from the lime mud washer and the dregs washer. A conventional Dorr liquor making system is used.

Green liquor from the smelt dissolving tank is pumped to the four-compartment green liquor clarifier, from which the overflow clarified liquor flowers to the lime slaker. Underflow from this unit is pumped to the dregs washer, which is another four-compartment unit similar to the green liquor clarifier. In fact, there are two more units in this system which are also quite similar, physically, to the green liquor clarifier and dregs washer. These are the white liquor clarifier and the lime mud washer. Although the materials handled and the operation of each of these four units is slightly different, the fundamental purpose of each is identical, that is, to separate suspended solids from a liquid.

Overflow from the dregs washer is used for dissolving smelt and the underflow is discarded.

The mixture of suspended lime and green liquor flows from the slaker and classifier to the three causticizer tanks arranged in series. The large pieces of lime and unburned cores are separated from the slurry before it leaves the classifier.

The causticizing reaction, which begins in the slaker is usually completed as the liquor is pumped from the last causticizer to the white liquor clarifier.

Clarified white liquor from this unit flows to the white liquor storage tank. Underflow from this unit is pumped to the lime mud washer. Overflow from this unit is used for dissolving smelt. Underflow from this unit is pumped to a Bird centrifuge which dewaters the lime mud for burning in the lime kiln. A screw conveyor carries the thickened mud into the Traylor lime kiln.

Make-up lime is added as limestone, which is carried up to the kiln in a bucket elevator.

After leaving the wet end of the kiln, gases go through a scrubbing tower and a dust chamber before passing out the stack. The dust chamber was designed by Riegel engineers.

There are three airveyor systems, supplied by the Fuller Co. One airveyor handles soda-ash and lime for the chemical make-up plant. Another airveyor handles lime to storage and then to point of usage for make-up in the liquor making system. A third airveyor handles salt cake to storage.

Power Plant

In addition to the recovery boiler which produces about 100,000 lbs. of steam per hour, there is power boiler equipped to burn either coal or oil and a refuse boiler. All were built by Combustion Engineering Co., and all produce steam at 625 psi, 725°F.

The power boiler is a Combustion Engineering type VU 50 equipped with two Raymond Bowl Mill Pulverizers to provide pulverized coal for four CE type R burners. Steam production is 100,000 lbs. per hour.

The refuse boiler is a CE type VU 40 equipped with a spreader stoker to handle bark and sawdust. Steam production is about 50,000 lbs. per hour.

Electric power is produced by a General Electric turbo-generator which takes steam at 600 psi, 700°F. and generates 3 phase 60 cycle AC at 4160 volts. Capacity is 7500 kw. Steam extractions are made at 150 psi and 50 psi and the exhaust goes to condenser. When the electrical load is below maximum the turbine is operated with a back pressure, exhausting at 50 psi.

Water Plant

One of the features of this plant is the modern water treatment plant which has a capacity of 13 million gallons per day. The raw water is taken from the Cape Fear River.

There are three Layne-Atlantic vertical raw water pumps that send the water up to the filter plant. Each pump has a capacity of 5750 gpm at 78 ft. head.

The river pump house also contains a Peerless vertical fire pump having a capacity of 1500 gpm at 125 psi.

At the filter plant, the raw water is mixed with the treating chemicals. Chemicals are measured by Amega 3 dry feeders. The dry chemicals flow into mixing tanks, from which the solutions flow into a 24 inch "Homomix" unit where it is blended with the raw water. The treated water flows into the three settling basins. The retention time of the water in these settling basins is 4½ hours.

From the settling basins the water flows into the sand filters. There are six of these filters. Each filter is 32 ft. long by 20 ft. wide.

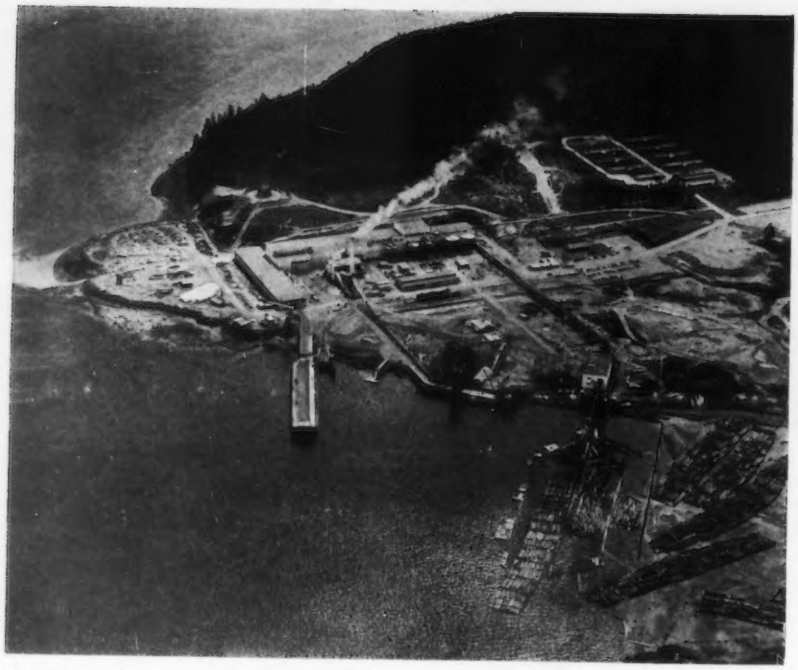
Each filter bed is backwashed as needed with a Worthington 12,000 gpm 60 ft. head pump.

Clear water from the filter flows to a clear well which holds 180,000 gallons which is connected to a reservoir that holds 1,700,000 gallons.

Three Worthington pumps are used to send the water to the pulp mill. Each pump is rated at 5000 gpm at 110 ft. head.

Ed. Note:

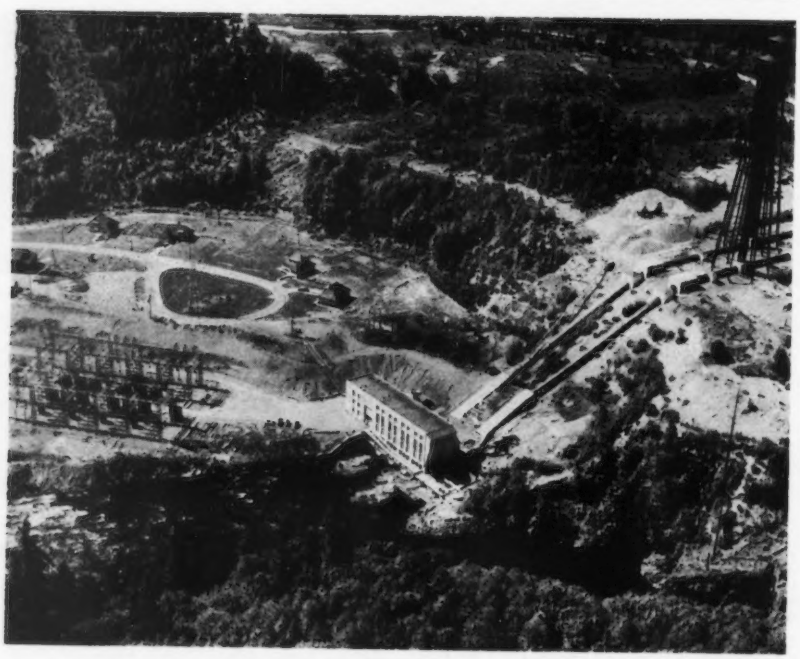
In fairness to all of the many suppliers the Reigel Carolina Corp., requests that their listing be omitted, because some one might be unintentionally overlooked.



Aerial view of the Elk Falls newsprint mill showing the flow of pulp from the booming area through to the finished product which is shipped from the dock on the left.

Elk Falls Starts Up

This story was sent to Paper Trade Journal on July 25th of this year. In the September issue of another publication a strikingly similar story was run and labeled as an exclusive field written story. Not wishing to run a story written by the editors of another publication in this field, we telephoned the Elk Falls Mill to discover the source of our story. This story was written by M. Martin of O'Brien Advertising Ltd., Vancouver, B. C., in conjunction with the builders of the Mill.



Aerial view of the 168,000 h.p. John Hart Hydro-plant of the B. C. Power Commission, which supplies Elk Falls mill with power.

Formal dedication of Elk Falls Co., Ltd., the 100,000 ton Crown-Zellerbach newsprint mill at Duncan Bay, Vancouver Island, British Columbia, took place September 15. The very modern news plant comprises a complete wood operation, groundwood pulping, and a 284-inch Fourdrinier newsprint machine with foundations adjacent for a second machine when required.

The mill site is two and a half miles north of Campbell River, on a bay into which flows Casey Creek. The area slopes gently toward the shore so that none of the main buildings have a ground floor elevation greater than 10-foot six inches above the level of the wharf decks. Waters of Duncan Bay are tidal, in Seymour Narrows.

Within this area are placed the combined machine room-groundwood mill building, and the power plant, on spread footings designed for 4,000 square feet of soil bearing value. The large woodstave, groundwood, blending, sulphite and broke tanks (concrete bases of which for mats designed for 8,000 square feet) and the paper warehouse.

Wood Room

The wood room provides barked cord wood of less than 16-inch diameter to the groundwood mill at the rate of ten cords per hour of a 24-hour day in spruce, hemlock and fir. It is of interest to note that the wood room is designed to supply the total daily requirements of 240 cords over a period of 16 hours with an average log size of six or seven inches. Operating time can be reduced accordingly for logs of larger size up to 40 inches diameter.

Logs are brought from the pond into the wood room by a steel log haul of manganese chain and chairs from A-1 Steel and Iron Foundry. At the entrance-way logs are cut to lengths up to 24-feet six inches by a 102-inch hydraulically controlled circular saw.

The logs are loaded to a roll case feeding the barker by a set of stop and loaders, which were specially developed for the range of log sizes handled in this mill. The three roll cases comprising the barker conveying system are each driven by a 20 hp motor through a Vickers variable speed Hydraulic unit, The barker infeed and outfeed roll case drives are synchronized so that each will operate at the same forward or reverse speed set by the operator.

The barker itself is a No. 20/40 rotary hydraulic whole log barker by Western Barkers Ltd. and consists of upper and lower rotating nozzle heads mounted in a structural steel frame, complete with necessary long holding down rolls, motors and shrouding. The top head can be raised or lowered to

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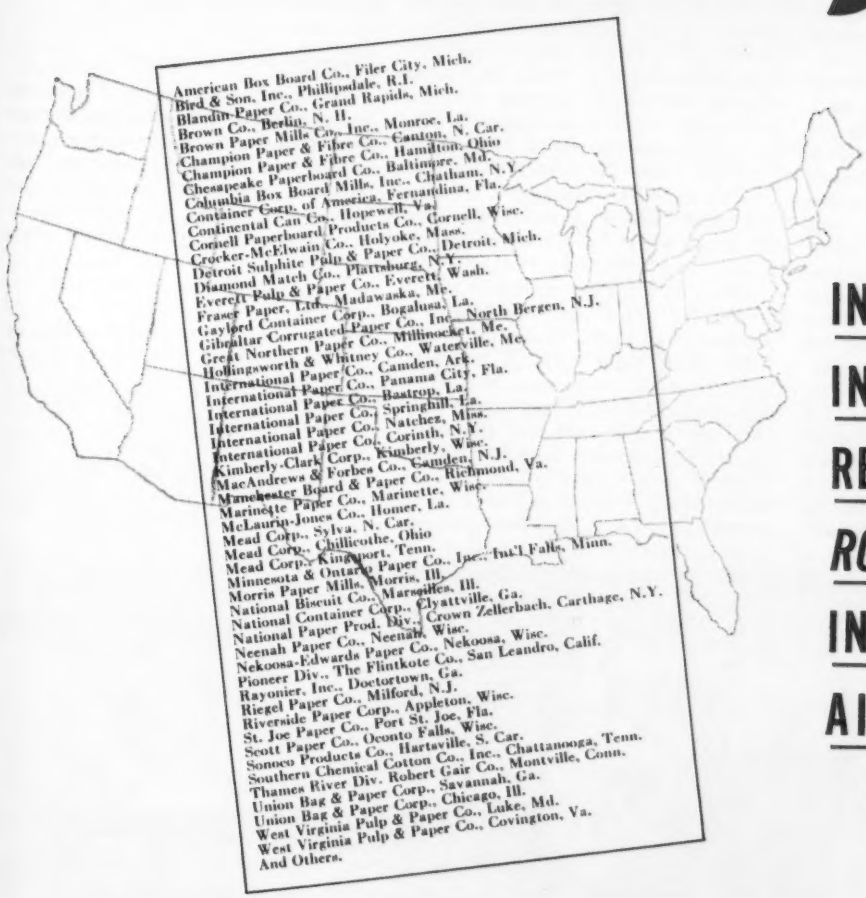
57 MILLS in 23 states INSTALLED ROSS AIR Systems


American Box Board Co., Filer City, Mich.
Bird & Son, Inc., Phillipsdale, R.I.
Blandin Paper Co., Grand Rapids, Mich.
Brown Co., Berlin, N. H.
Brown Paper Mills Co., Inc., Monroe, La.
Champion Paper & Fibre Co., Canton, N. Car.
Champion Paper & Fibre Co., Hamilton, Ohio
Chesapeake Paperboard Co., Baltimore, Md.
Columbia Box Board Mills, Inc., Chatham, N.Y.
Container Corp. of America, Fernandina, Fla.
Continental Can Co., Hopewell, Va.
Cornell Paperboard Products Co., Cornell, Wisc.
Crocker-McElwain Co., Holyoke, Mass.
Detroit Sulphite Pulp & Paper Co., Detroit, Mich.
Diamond Match Co., Plattsburg, N.Y.
Everett Pulp & Paper Co., Everett, Wash.
Fraser Paper, Ltd., Madawaska, Me.
Gaylord Container Corp., Bogalusa, La.
Gibraltar Corrugated Paper Co., Inc., North Bergen, N.J.
Great Northern Paper Co., Millinocket, Me.
Hollingsworth & Whitney Co., Waterville, Me.
International Paper Co., Camden, Ark.
International Paper Co., Panama City, Fla.
International Paper Co., Bastrop, La.
International Paper Co., Springhill, La.
International Paper Co., Natchez, Miss.
International Paper Co., Corinth, N.Y.
Kimberly-Clark Corp., Kimberly, Wisc.
MacAndrews & Forbes Co., Camden, N.J.
Manchester Board & Paper Co., Richmond, Va.
Marinette Paper Co., Marinette, Wisc.
McLaurin-Jones Co., Homer, La.
Mead Corp., Sylva, N. Car.
Mead Corp., Chillicothe, Ohio
Mead Corp., Kingsport, Tenn.
Mead Corp., Nekoosa Paper Co., Inc., Int'l Falls, Minn.
Minnesota & Ontario Paper Co., Int'l Falls, Minn.
Morris Paper Mills, Morris, Ill.
National Biscuit Co., Marseilles, Ill.
National Container Corp., Clyattville, Ga.
National Paper Prod. Div., Crown Zellerbach, Carthage, N.Y.
Neenah Paper Co., Neenah, Wisc.
Nekoosa-Edwards Paper Co., Nekoosa, Wisc.
Pioneer Div., The Flintkote Co., San Leandro, Calif.
Rayonier, Inc., Doctortown, Ga.
Riegel Paper Co., Milford, N.J.
Riverside Paper Corp., Appleton, Wisc.
St. Joe Paper Co., Port St. Joe, Fla.
Scott Paper Co., Oconto Falls, Wisc.
Sonoco Products Co., Hartsville, S. Car.
Southern Chemical Cotton Co., Inc., Chattanooga, Tenn.
Thames River Div. Robert Gair Co., Montville, Conn.
Union Bag & Paper Corp., Savannah, Ga.
Union Bag & Paper Corp., Chicago, Ill.
West Virginia Pulp & Paper Co., Luke, Md.
West Virginia Pulp & Paper Co., Covington, Va.
And Others.

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Left to Right—H. J. Mackin, President; Paul Cooper, Vice-President; R. J. Filberg, Vice-President; T. B. Hargreaves, Resident Manager and Director; H. C. Graham, Technical Supervisor; E. C. Cooley, Resident Engineer.

suit the size of log and a 10 hp motor and suitable counterweights are used for this purpose. The barker uses water at 1200 p.s.i. and the heads are rotated by 15 hp vertical electric motors through V-belts. As the log enters the barker it strikes a control gate which positions the top head to clear the log.

A log leaving the barker, if under 16-inches diameter is lifted out to a deck and transferred to a five-saw slasher. Alongside one end of this deck is placed a log aligner which brings the ends of all logs into line 49-inches from the first of the five slasher saws, thus reducing to a minimum waste wood due to short end cut-offs. The logs are passed one at a time to the slasher deck, the feed controlled by a a set of hook stops. After being cut into 49-inch lengths, the blocks are dropped into a conveyor having manganese steel chain and flights by A-1 Steel and Iron Foundry, which carries them to a flume leading to the groundwood mill.

If the log is over 16-inches diameter and too large for the grinder, the operator allows it to pass along the rollcase until it reaches a position where it can be lifted out to a transfer deck leading to a conveyor feeding the 102-inch splitter cut-off saw. The deck and conveyor are of similar type and construction as those feeding the barker. The feeder deck travels at 250 ft./min. and is reversible, thus enabling the operator to quickly adjust the position of the block to suit the splitter axe.

Considerable care has been taken to insure that the operation is clean, and to this end all holes in the operating floor, necessary for refuse and water disposal, are totally enclosed with the watertight chutes which discharge to a series of refuse conveyors. One special conveyor under the barker is made to take all the barker effluent. The water and small bark is screened out from the larger pieces by passing through a grizzly plate. The larger bark is then carried to a conveyor leading to a hog, whilst the water and small bark is pumped away to the sewer.

The flock flume receives the 4 ft. wood from the manganese steel flight conveyor which has picked up the wood from the slasher deck and the steam splitter. It extends a distance of about 1,000 ft. to a point near the Grinder Room where it terminates at a set of driven pick-up rolls. The flow of blocks from the flume on to these rolls is controlled by damming and further assisted by a variable speed drive at the rolls, which functions combine to deliver wood to the Grinder Room conveyor system at the desired rate.

Mounted on the flume is a traveling wood extractor in the form of a short conveyor unit. This device is used when it is desired to unload wood from the flume for piling in the reserve storage area alongside the flume.

Groundwood Department

The Groundwood Department embraces grinding, screening and thickening, brightening by zinc hydrosulphite process and washing, storage and blending. In general the Groundwood Department forms a continuation of the "wet" end of the Machine Room Building.

The pulp wood is delivered in 4 ft. lengths. Most of the wood is round, but oversize pieces are split so that under no conditions will any piece have cross-sectional dimension in excess of 16-inches — the limitation being the width of the grinder pocket.

Owing to the species of wood handled, the metallurgy of this department is generally non-ferrous. Piping is mostly of woodstave and stainless steel; fittings and valves of bronze or stainless steel, depending upon the size and service. Prior to the brightening process, stainless steel where used is Specification 304. At and subsequent to

At Left—Typical new growth in the Duncan Bay Forest Management License. Young trees shoot up among stumps of logged trees. At Right —The chain haul which brings pulpwood from the booming area to the woodmill.

Left to Right—J. Youden, Paper Machine Superintendent; S. Jemson, Steam Plant Superintendent and Purchasing Agent; J. W. Hill, Groundwood Mill Supervisor; J. L. Marshall, Electrical Supervisor; D. G. Martin, Office Manager; C. J. Hague, Personnel Manager.

brightening, Specification 316 is used.

The stock and white water pumps were supplied by Bingham and Allis Chalmers. Pump casings are of acid resisting bronze, and impellers of bronze or stainless steel.

The Impco agitators have bronze impellers, and iron contact parts are Lithcoated. They were supplied by Sherbrooke Machineries Ltd. The vertical blending tank agitator equipment was supplied by Bingham Pump Company. All concrete stock and white water flumes, chests, and tanks have tile linings installed by Stebbins.

The building is fully heated and ventilated by equipment furnished by Ross Engineering Co. The thickeners and washers have special ventilated hoods.

Grinding

There are six Waterous Great Northern two-pocket grinders, equipped with 67 in. diameter by 54 in. wide Norton artificial stones. They are placed in lines of two, and each line driven at 257 r.p.m. through a 72 in. belted type, flexible coupling by a Canadian Westinghouse 5,500 hp synchronous motor. The Grinders are equipped with Waterous load control and master governors.

The wood entering the Grinder Room, lying lengthwise in a three-strand inclined chain conveyor, is passed over a set of thirteen differential speed spiked straightening rolls, entering at 230 f.p.m., from which it is ejected onto a ten-strand roof top transfer which delivers to a three-strand roller top transfer conveyor on which the wood travels to the Grinders.

At each Grinder line the operator draws the blocks over the roller tops into chutes which feed the Grinder pockets. In order to allow re-selection of wood by each Grinder operator, the roller top transfer is "broken" between each Grinder line so that each section may be independently stopped or reversed.

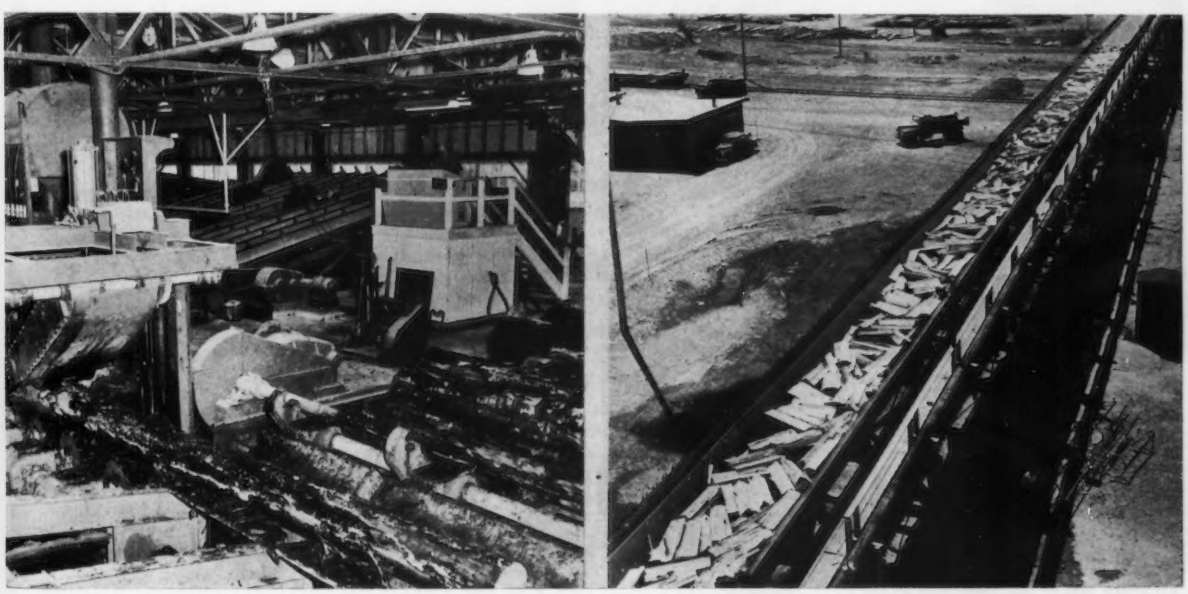
The species delivered to the Grinder Room is held to about 15-20 percent spruce and the balance hemlock and fir. One stone is reserved for the spruce and this species is identified by a splash of dye applied in the Woodroom.

Wood which is not used by the Grinders in the first pass is carried through to a three-strand recirculating conveyor, which in two stages delivers the wood back to the main conveyor entering the grinding room.

From the Grinders the stock is discharged at about 2 percent consistency into tile-lined flumes below, which, after dilution to about 1.5 percent consistency deliver to two 5 ft. diameter x 12 ft. Pascol coarse screens having ¼ in. perforations which discharge direct into the stock chest below at about 0.7 percent consistency for delivery to the fine screens. This stock chest is agitated by a 48 in. diameter, horizontal shaft, agitator unit having an acid resisting bronze propeller and lithcoated shaft and other contact parts.

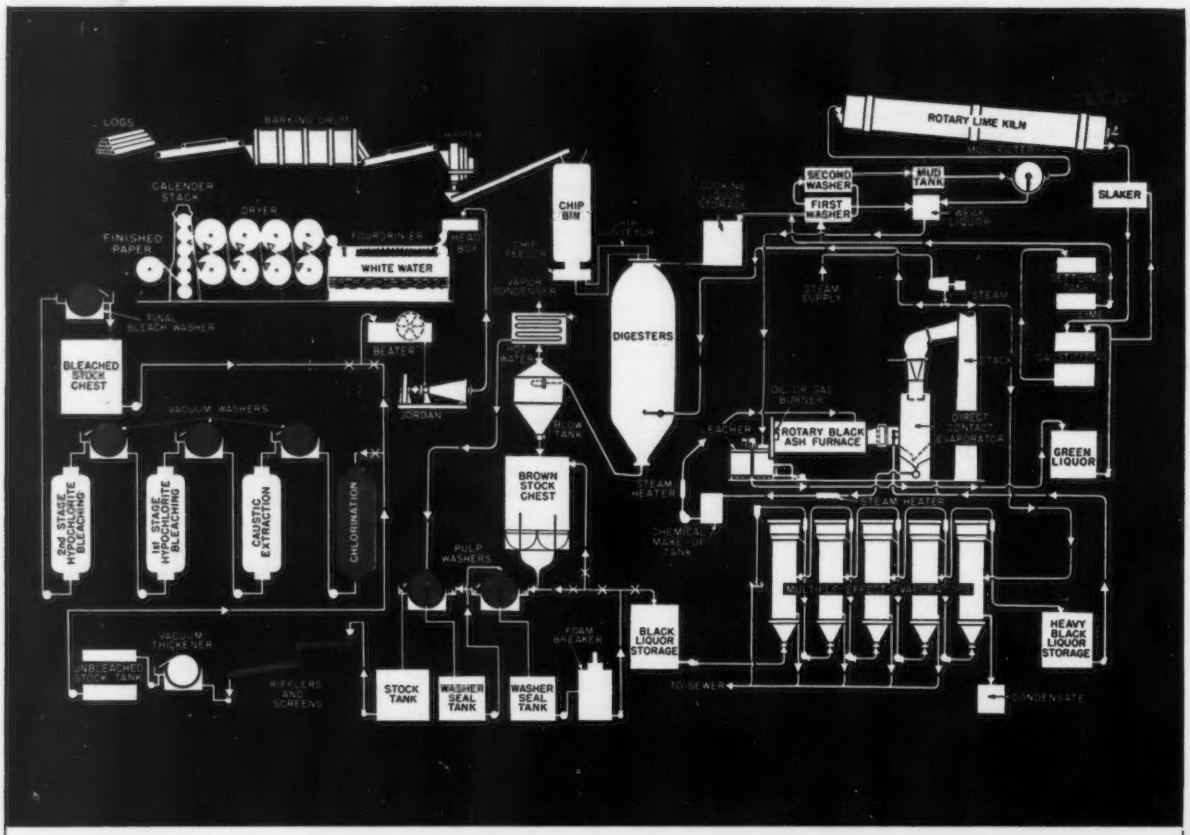
Screening and Thickening

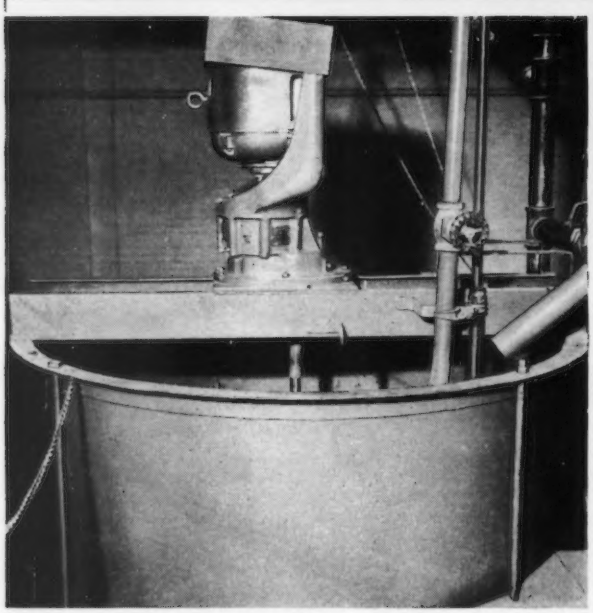
From the Coarse Screened Stock Chest the stock is pumped at 0.7 percent consistency to a battery of three Cowan Type C fine screens (one of which is a spare). The accepted stock leaves at 0.6 percent consistency, and



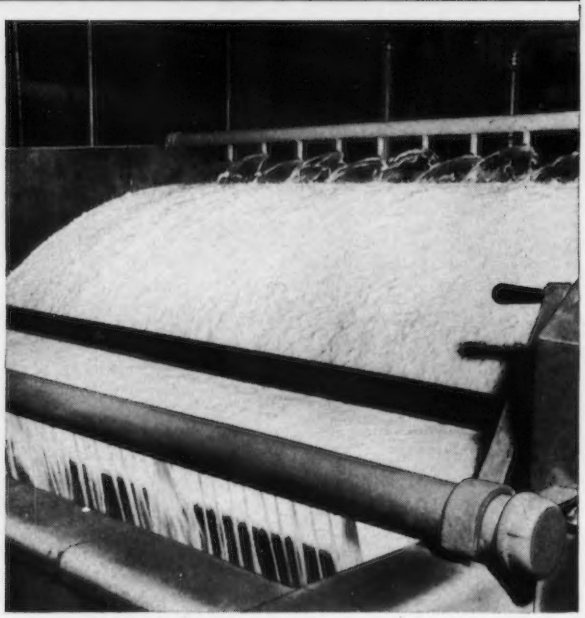
At Left—Jets using 1200 lbs. per square inch pressure strip bark from the pulpwood in this hydraulic barker at the woodmill. At Right—The flume floats pulpwood from the woodmill to the groundwood room.

How P. H. GLATFELTER COMPANY





ANOTHER USE of Stainless Steel at the P. H. Glatfelter Co., Spring Grove, Pa., is this starch mixing tank. The agitator, as well as the tank proper, is Stainless Steel.



THE WIRE AND ROLLS on this black liquor washer are made of Stainless Steel to resist the corrosive effects of the pulp and cooking liquor as it comes from the digester.

uses Stainless Steel

to assure longer equipment life and a cleaner end product

● No matter what pulp process a mill uses, Stainless Steel is almost invariably called on for service in the equipment where wear and corrosion concentrate their attack. The flow sheet of the operation of the P. H. Glatfelter Co., Spring Grove, Pa. —a soda process mill—shows how extensively Stainless Steel is used.

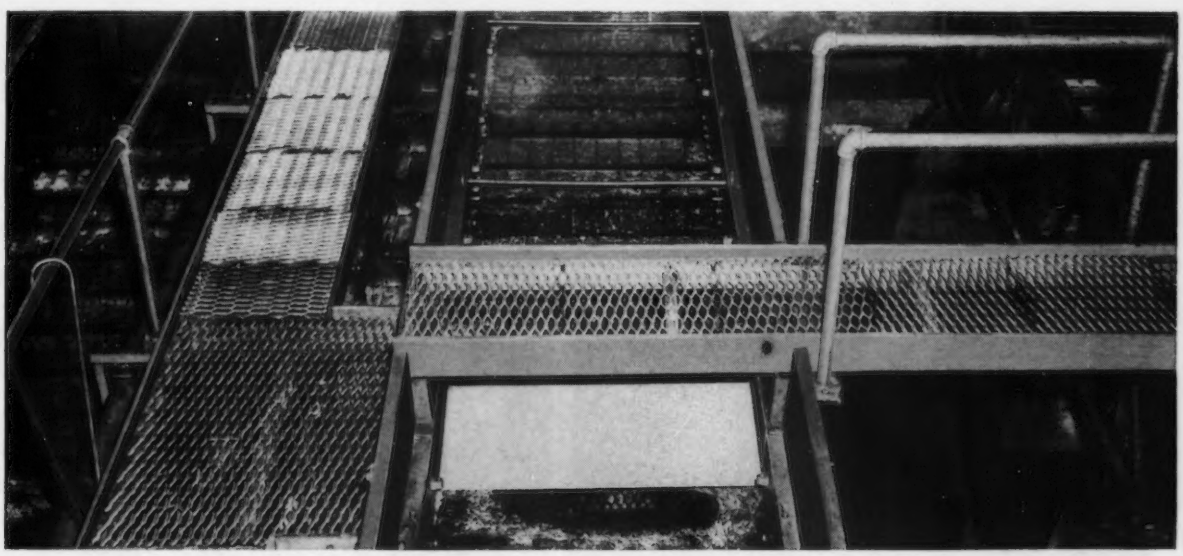
As indicated in red, Stainless Steel is used in the black liquor washer, in flat screens, in doctor blades on the winding rolls, in transfer pumps and chemical mixing tanks. In the bleach plant, the chlorinator propellors and washer press rolls are now Stainless Steel, and conveyors and piping are being converted to Stainless.

Plant Engineer N. B. Rohrbaugh accounts for this extensive use of Stainless Steel in this way: "In addition to the longer life we are getting in much of our equipment through Stainless Steel's greater corrosion and wear resistance, Stainless Steel also contributes toward a cleaner end product. We are planning to use much more Stainless Steel equipment in the near future."

One of the Glatfelter Company's new applications of Stainless Steel is in the valves for digester liquor lines and relief lines.

For long life, corrosion resistance and freedom from product contamination, you'll find Stainless Steel a "must" in many places in your mill. And for the finest performance, instruct your equipment fabricator to use U·S·S Stainless Steel.

BREAKAGE on this eccentrically-vibrating flat screen was eliminated and overall life was extended substantially by replacing material previously used with Stainless Steel.



UNITED STATES STEEL COMPANY, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
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U·S·S STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

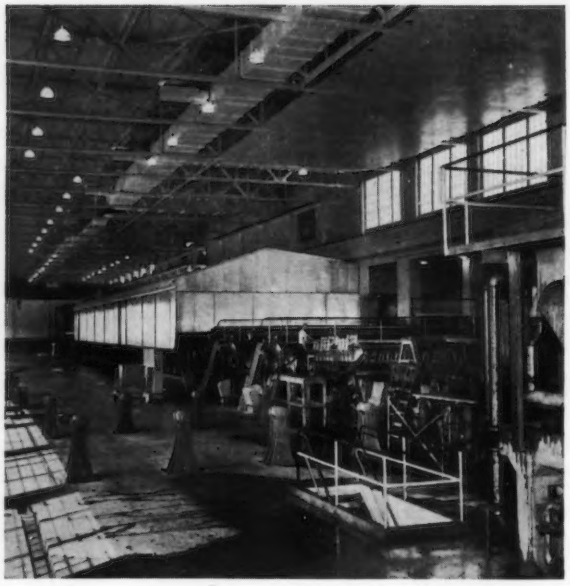
2-1283

UNITED STATES STEEL

the tailings pass to a Cowan Type D screen at 0.5 percent. The rejects go to waste, pending a future refiner installation.

The screened stock then passes over four 8 ft. x 16 ft. Oliver vacuum thickeners, leaving the doctors at 12 percent.

The stock on leaving the thickeners is diluted to 5 percent and receives an injection of zinc hydrosulphite on the inlet side of the pump which delivers it to the bottom of a one-hour, tile-lined retention tower, equipped with P.M.L. Co. circulating equipment. Discharged from the top of the tower, it is diluted to 2 percent prior to passing over to two Oliver double-ported vacuum washers. Leaving the washers at 12 percent, it is diluted to 3.5 percent and pumped thence to storage. Washing is carried out with Groundwood Mill and Machine Room white water with the addition of some fresh water. A small amount of the clear effluent from the washer is used for dilution at the washers as well as at the thickeners. These washers have full barometric legs assisted by a Roots-Connersville vacuum pump.



The "wet" end of the 400-foot long newsprint machine.

Storage and Blending

From the washers the stock is pumped to two 50 ft. diameter x 50 ft. high woodstave storage tanks having about 107-tons b.d. capacity. These tanks are set on concrete footing walls and concrete bases which are fully tile-lined. Agitation is maintained in each tank by a 72 in. Impco horizontal shaft agitator. Circulation in these tanks is directed by the use of midfeathers.

From these two storage tanks the stock is pumped to a 40 ft. diameter x 40 ft. high woodstave blending tank of similar construction to the storage tanks, and having about 55-tons b.d. capacity. This tank has no midfeather, however, and is agitated by a Bingham vertical shaft agitator driven at 24 r.p.m. by a 150 hp motor.

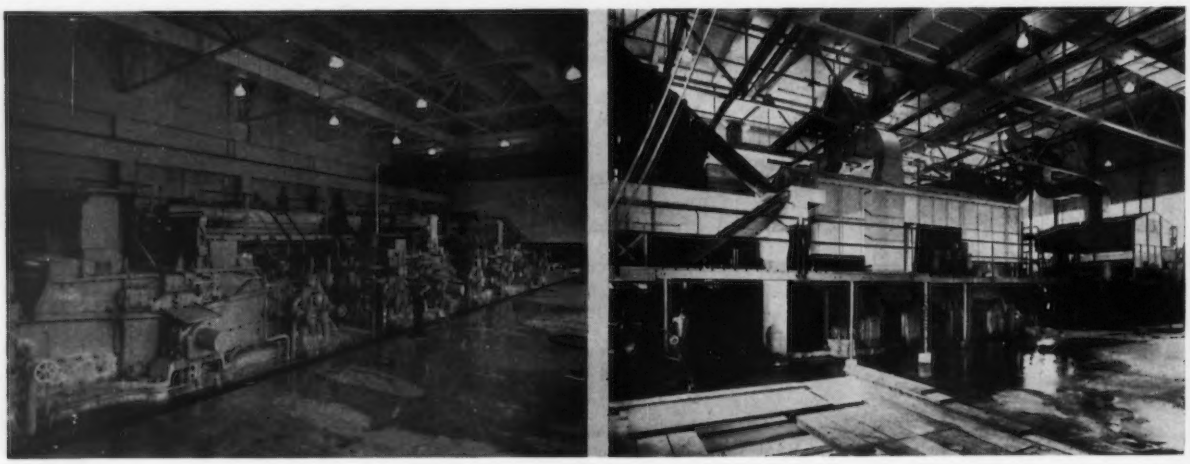
Machine Room, Sulphite and Product Handling

The machine room at present houses one 284 in. Dominion Engineering news machine and provision has been made for extension of the structure, crane, etc. to accommodate a future machine of the same size or larger.

Principal equipment is the Dominion Engineering Works paper machine fed by six Bird Screens. A Dominion Engineering Works winder supplies newsprint rolls to the Lamb-Grays Harbor finishing equipment. Vapor evacuation and fresh air supply are through a Ross Engineering of Canada hood and fan equipment.

Groundwood stock is brought from the 30-ton capacity woodstove blending tank which terminates the Groundwood Department flow. This tank is equipped with Bingham vertical agitation, Neoprene coated. From the Blending Tank the stock is pumped through a DeZurik consistency controller to a Fischer & Porter proportioner which proportions groundwood, sulphite and broke into the 20-ton capacity machine chest. Stock and white water piping is principally creosoted woodstave with stainless steel fittings and valves.

Sulphite from soaking storage (sulphite preparations will be taken up later) is pumped to a 10-ton capacity chest equipped with Sherbrooke propeller agitation. From there it passes through a DeZurik consistency controller and through the E. D. Jones re-



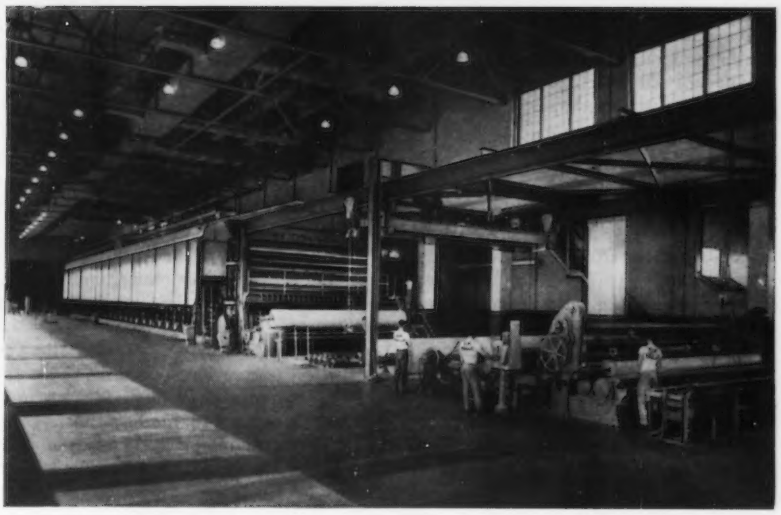
At Left—Three of the grinders which crush wood into groundwood stock. At Right—The screen room, where pulp is screened, thickened, washed and brightened.

finer to the proportioners and into the machine chest.

The mixture of groundwood, sulphite and broke from the machine chest is pumped to a small stock box where a portion is bled off and introduced into the mixing pump through a DeZurik micro-controlled plug valve located near the mixing pump. This stock plus white water from the wire pit is delivered to the Bird screens through control valves which automatically maintain a constant head in the Bird screen outlet flow box, eliminating the need for dams at the screens. The outlet flow box is of fabricated stainless steel sheets. Net, the dilute stock passes through a second mixing pump and up through a Beloit Streamflow valve and into the two sides opposed entries of the headbox.

The headbox is patterned after one developed by Beloit Iron Works in Beloit, Wisconsin, wherein the liquid level is maintained by air pressure in the top of the enclosed headbox. The air pressure is equivalent to 5 to 20 feet of water, depending on the desired velocity at the slice. Five variable speed, oil driven distributor rolls are located in the headbox. All surfaces contacting the stock are of stainless steel.

The Fourdrinier section is of the removable type, having adjustable incline with 284 in. x 100 ft. wire. There are five wire return rolls, one driven. Three forming boards, fifteen table rolls, one dandy roll, eight suction boxes and the 54" couch rolls make up the balance of wire section. The couch is equipped with 2-stage vacuum boxes, and a 19 in. rubber covered presser roll. There are two presses, each with a 38 in. rubber covered suction roll and a 32 in. granite roll. A Vickery felt conditioner operates on the 1st press felt. Five Roots-Connersville two-stage vacuum pumps are connected to the couch and press sections.



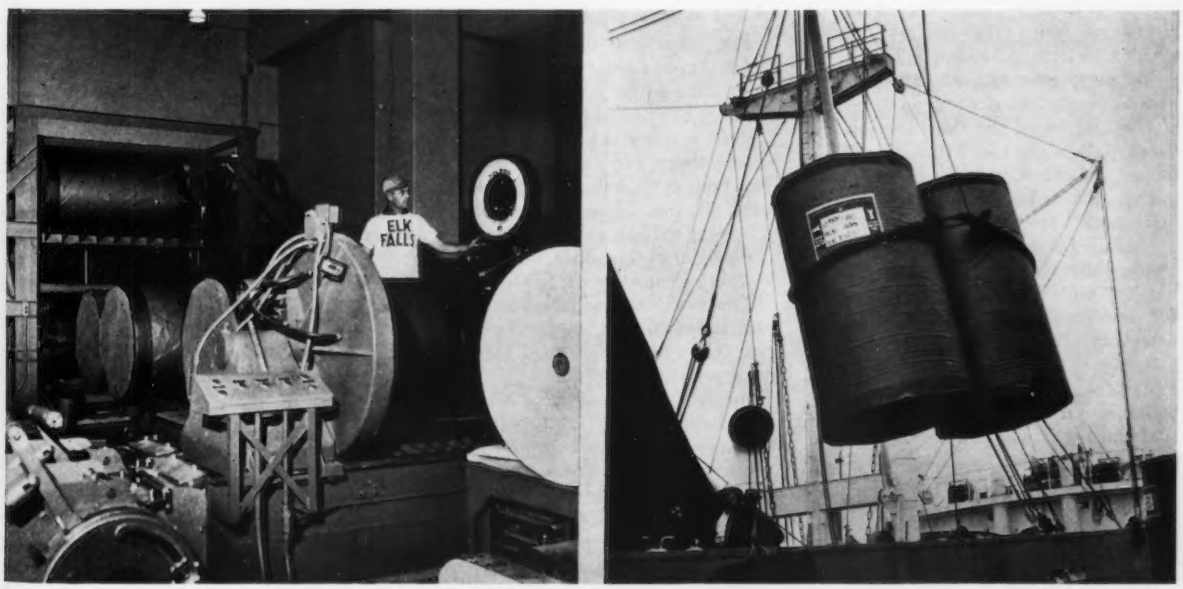
The "dry" end of the newsprint machine, showing the calender, stack, reel, and winding section.

The dryer section is made up fifty 60 in. x 282 in. main dryers carried on Michell bearings and ton felt dryers equipped with SKF spherical roller bearings. Dryer felt rolls are likewise held by SKF spherical roller bearings. 35 lbs. p.s.i. steam pressure is supplied to the dryers and condensate is handled through a 3-stage Cram system. Seven dryer felts are used.

The calender section is made up of one 40 in. x 276 in. bottom roll weighing 46-tons and seven upper rolls, three of which are bored for steam. The water-cooled Pope reel is designed to make 61 in. diameter rolls.

This paper machine incorporates all the latest developments in newsprint making and is built and balanced to run up to 2,000 ft. per minute. Labor-saving devices for threading the machine and for broke handling, etc., are taken care of in the design of the machine. No materials subject to rust or corrosion are in contact with stock solutions. Instruments control and record such functions as press roll loading, temperatures, stock chest levels, valve openings, steam pressures, etc., so that running adjustments to the Paper Machine are made mostly by push button control.

All sectional drives comprise d.c. motors controlled by the Harland system



At Left—Newsprint rolls are capped, wrapped, and weighed automatically. At Right—Rolls are loaded into ocean-going freighters.

and coupled through gear reducers to the machine. There are five drives to the dryer section and six others for the balance of the machine. The machine is designed for production of 320-tons per day.

Roll Handling

The rolls of paper are carried from the reel to the winder by a two hook, 12-ton overhead Dominion Bridge Company crane. The Dominion Engineering Works winder is equipped with regenerator braking (30 kw) and Ward-Leonard tension control. Winder newsprint rolls are delivered from the winder across hydraulically operated lowering tables onto a flat top chain conveyor where the core shaft is extracted and the newsprint is carried over to a sorting dock on the backside of the winder. The winder is equipped with hydraulic roll ejector box and hydraulically operated rider roll.

Sulphite Pulp Preparation

Wet lap pulp is purchased and unloaded from barges at the dock. The pulp is mainly stored in the open on pallets handled by fork trucks. Squeezer trucks lift the pulp from the pallets and set it on a belt conveyor which leads to the Kennedy Pulpmaster. The conveyor and repulper work together to accomplish their designed purpose of high capacity and uniformity of feed. Units of sulphite are conveyed, at regular intervals, into the repulper which operates continuously shredding, pulping, and discharging to the soaking storage tank. Uniform feed to the repulper results by dividing the belt conveyor into three sections. The first section is longest and is used for receiving bundles from the truck; it discharges onto the second section which by electrical contacts feeds pulp units at predetermined intervals of time onto the third section; traveling at constant speed the third section elevates pulp over the brim of the repulper vat. Designed for generous capacity, the pulping operation for 24 hour paper production can be accomplished in 16 hours or less by virtue of ample slush pulp storage. A Bingham vertical pulp pump picks up the stock for the repulper, purges it of excess entrained air, and discharges it to the top of a 40 ft. x 40 ft. high woodstave stock tank. Equipped with vertical propeller agitation, the tank serves as a soaking stage wherein any remaining unbroken fines may be dissolved. Leaving the soaking tank, the pulp follows the route previously described.

Broke Handling

The broke system was partly described under "Stock Flow to Paper Machine." The balance to be described here is composed of the broke beater, the couch broke chest and the broke take up tank.

Dry broke from the sweat dryer, calender stack and reel fall into the beater through chutes reaching from the tub to the floor above. Windertrim is carried through a Ross Engineering vacuum and conveying system to the beater.

The broke beater, manufactured by Waterous Limited, is a triple flow type composed of two rolls, one feeding and one beating, designed and installed to function without an operator. Dry paper falls into the tub and is treaded under the liquid surface by the feeding roll (8 ft. diameter at 18 r.p.m.) then flows up over a short backfall.

Couch broke from the paper machine wire is showered down into a chest under the couch roll. The agitator is a horizontal shaft paddle type with twelve paddles making a 10 ft. swing at 13 r.p.m. Stock is pumped from the sump at one end to the broke take-up tank.

Built with a concrete base, woodstave sides and wood top, the broke take-up tanks hold 40-tons at 3 percent. Two Sherbrooke propeller agitators on a single shaft move the stock around vertical baffles.

Docks and Shipping Facilities

Outgoing paper and incoming raw materials are handled through the warehouse, the main shipping dock, the scow unloading dock and the railroad car barge dock. The latter provides the mill with railroad connections to the mainland by means of car barges which float six to twelve railroad cars to and from Vancouver.

The warehouse is a 840 ft. x 87 ft. building; primarily for storing newsprint rolls while accumulating a shipload. The building itself is timber framed and trussed, sheathed with plywood; there are no interior columns. The floor is asphalt paving at the same level as the adjacent machine room basement. Newsprint rolls may be triple decked standing on end giving a storage capacity of 5500-tons.

The majority of the plant's production is shipped by ocean going steamers. They tie up and load at the main dock which is 64 ft. x 400 ft. having a covered portion 32 ft. x 370 ft. The covered portion is provided with eighteen doors, which roll up overhead when open. Storage capacity is approximately 1000-tons. The dock projects out into the sea so the full length of either side may be used for loading. Shore contact is made by a covered ramp connecting to the plant road system and to the main warehouse. Newsprint is carried to the dock with gas driven trucks.

Mill Heating and Ventilating System

The mill ventilation was designed and furnished by Ross Engineering of Canada, Ltd., whose Vancouver office worked closely with H. A. Simons, Consulting Engineer. A complete system was installed in the Machine Room. The dryer section is equipped with an Insulated Aluminum Panel Hood carried on structural steel members supported from the machine frame and the rear-side wall. Front and rear sliding panels facilitate maintenance and inspection, and the roof panels are readily removable in small easily-handled units for major overhauls. Three exhaust fans, located in an adjacent fan room, exhaust a total of 300,000 c.f.m. of vapor from the hood.

This volume is replaced by means of a Room Supply System equipped with extended surface steam heating coils and centrifugal fans and ductwork to distribute the air evenly throughout the truss area, working level, Machine Room basement and the adjacent Screen Room. A portion of the supply volume is directed to the bottom dryer felts to increase their effectiveness in drying and to prolong their life.

The dryer section is also equipped with a Ross-Grewin System, which injects hot dry air at high velocity into the pockets formed between the sheet and felt travel. The drying rate is thereby increased and sheet moisture content made more uniform.

The calender stack is provided with a modern, flexible high-pressure calender cooling system for spot cooling of the intermediate and first top rolls. Nozzles can be bunched together to concentrate on a particular spot on the calender roll, or completely shut off, as desired.

All systems, except the Ross-Grewin system, are equipped with automatic temperature control to maintain the required conditions with a minimum of steam usage.

An Exhaust System was furnished for the Oliver washers and deckers in the Screen Room. Due to the corrosiveness of the Zinc-hydrosulphite used in the process and the natural corrosive action of vapor from untreated groundwood stock, both washers and decker hoods are of transite and stainless steel; the exhaust ductwork is of stainless sheet steel and the exhaust fans have interior coating of Neoprene.

Grinder Room ventilation consists of Grinder Motor Cooling, Vapor Exhaust and Room Supply Systems. A mixture of outdoor and room air is introduced at a constant temperature to each grinder motor pit and is forced radially outward by the centrifugal action of

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the rotor through the stator winding, thereby ensuring continuous operation of the motor by preventing its overheating.

A portion of this heated air is then drawn from the Motor Room by the Grinder Room Supply unit, which distributes it throughout the Grinder Room operating area and the basement. Steam coils heat the supply air during shutdown or winter when the losses from the grinder motors will not satisfy the heating requirements.

The vapor Exhaust System draws vapor from the grinder pockets, the stock channels and the Pascol coarse screens in sufficient quantity to prevent any moisture build-up in the room.

In addition to the foregoing, ventilation is provided for the Superintendent's offices, the Paper Testing Room and the Chemical Laboratory. The Mill Locker Room, located in the Grinder Motor Room basement, has a separate Heating and Ventilating System with exhaust from the individual lockers.

These ventilation systems will play a major role in providing good working conditions, and protecting the buildings and equipment from deterioration, so important in these days of progressive labor relations and high replacement costs.

Power Plant

The boiler house is designed for maximum ease and efficiency in operation as well as low cost of construction. Turbine drive d.c. generator for machine drive as well as turbine-driven high pressure barker pump, feed pumps, hotwell pumps and air compressor are located on ground floor. A steel sash partition divides the turbine and pump hall from the boiler room, keeping out dust but affording a full length view to the operator at all times.

With higher fuel costs and decreasing supply of hogged waste wood, steam generators were designed for burning more than one fuel. More emphasis was put on efficient use of both hogged fuel and oil. The conventional dutch-oven cells have been replaced by spreader stokers, with considerable saving of building space and elimination of the usual refractory maintenance inherent with these cell.

Fuel control is fully automatic, thus ensuring maximum efficiency when burning either hogged fuel or oil.

A further saving of building space was made possible by the installation of the induced draft fans outside of the boiler house. Gas ducts leaving the air heaters pass outside of the building to fans with ample provision for the installation of dust collectors, should these become necessary. Induced draft fans and turbine drives are fully insulated and weatherproofed.

Stack and breechings have been designed to allow for the possible addition of a third boiler.

Average steam usage at full mill capacity is around 120,000 lbs. per hour, with a peak and winter load allowance of 10 percent. Power generation for Paper Machine drive and turbine driven auxiliaries were fundamentally considered as a by-product of an essential steam and process-heating load, and to meet this condition it became necessary to take advantage of higher steam pressures and temperatures in order to generate more by-product power per pound of steam.

Heat balance calculations showed that most economical arrangement was to employ turbine throttle conditions of 600 p.s.i.g. 650° F with back-pressure exhaust at 35 p.s.i.g.

Two reducing and de-superheating stations were incorporated in the cycle to provide the necessary flexibility and aid in taking care of the peak winter heating load.

Steam Generating Equipment

Steam is supplied by two Combustion Engineering V.U. type, two-drum, water tube boilers, equipped with superheaters, waterwalls and steel enclosed casings. Design pressure is 675 p.s.i.g. and steam is generated at 600 p.s.i.g. Temperature at the Superheater outlet is 650°. Each boiler has a maximum continuous rating of 85,000 lbs. of steam per hour when burning hog fuel, and of 12,000 lbs. of steam per hour when burning oil.

Firing is by means of mechanical spreader stokers using hog fuel, and each boiler is also equipped with four Todd steam atomizing oil burners. It is planned to burn hogged wood waste having a heat content of 3,950 B.t.u. per pound, and a moisture content up to 56 percent. Approximately 260 units will be required per twenty-four hours, of which 60 units will be waste bark, ends, and sawdust from the woodroom operation. Fuel oil (Bunker C) is used only as a secondary fuel when required.

Heat recovery equipment in each unit comprises a two-pass tubular air pre-heater having a heating surface of 4,850 sq. ft. and capable of pre-heating combustion air up to 350° F.

Turbine Generator and Drives

A 2,000 hp DeLaval 5-stage turbine with reduction gear is installed driving a 2600 r.p.m. d.c. generator. Turbine operates at 3,650 r.p.m. and throttle conditions are 600 p.s.i.g. and 650° F.

A 1500 hp DeLaval turbine operating at 3600 r.p.m. under similar steam conditions is used to drive a Bingham Hydraulic Barker Pump.

There are seven other single-stage DeLaval turbines driving pumps and fans having a total capacity of 910 bhp. All turbines operate at 600 p.s.i.g. 650° F with 35 p.s.i.g. back pressure.

Electrical System

The installation comprises some 30,370 connected hp of electrical motors ranging in size up to 5,500 hp. Some 2,790 connected hp is served by a turbogenerator utilizing process steam. The balance of the load consisting of 27,580 connected hp is supplied from the Vancouver Island system of the B. C. Power Commission who serve the plant with duplicate 138 kv transmission lines. This voltage is stepped down at the plant site through two 15,000/20,000 kva, 3 phase transformers and delivered at 13.8 kv.

A feature of this transformer installation is the use of automatic voltage regulating equipment made necessary by the close proximity of the main generating station which is designed primarily for the long distance transmission of bulk power, and has a wide variation in station voltage through the daily load cycle.

Forest Management

Forest management angles are always of interest in new Canadian operations due to the relationships normally involved with the Dominion government. The Duncan Bay Forest Management License is located on Vancouver Island; no virgin timber, but only logged-off lands, are involved in this management license from the Crown.

The Management License area comprises approximately 370,628 acres, 237,475 owned by the Crown and 133,475 owned by Canadian Western Lumber Company. The Crown granted the company right to grow trees on this area. The company is to pay all costs and assume all risks and expenses in connection with keep-value of all reproduction removed from the area. No reproduction can be cut from Management License until 1974. Thereafter the area will produce 15 million cubic feet of timber per annum in perpetuity on a sustained yield basis. All pulpwood from Management License must be processed on the Bay.

Until 1974 when wood from the Management License becomes available the Duncan Bay Plant will operate on material from Canadian Western Lumber Company operations, such materials to consist of small wood, cull logs, sawmill waste, etc., until recently considered waste in the Coast region of British Columbia.

A brief description of the Western Canadian salvage logging is as follows: after an area of virgin timber

has been logged with heavy, slow, powerful equipment to recover the large timber the ground is covered with slash. Light, fast, highly portable equipment is then used to relog the area and recover from the slashing wood suitable for manufacture into pulp. This salvaged wood is of very good quality, clean and sound, consisting mostly of hemlock trees too small to be recovered with the heavy, slow equipment employed in logging the big saw-log timber. Because small trees recovered in relogging have little volume and are light compared to the sawlog timber they must be handled fast. These small logs are taken out of the woods in mixed lengths, and because they do not float well they are tied into bundles with steel cables and towed in large rafts to the pulp plant. Each bundle contains about fifteen cords and each raft contains about 1,000 cords. Experience has proved that twenty-five percent additional timber volume can be recovered from an area by relogging for pulpwood. This recovery of pulpwood left on the ground after conventional logging is virtually a new industry.

Anglo-Canadian Improvements Include Three New Digesters

The addition of three new sulphite digesters, together with other pulp mill equipment, marks the completion of another phase of the improvement program which has been in progress at Anglo-Canadian Paper Co., for the past several years.

This mill, which was originally built in 1927, is situated within the limits of Quebec City at the junction of the St. Charles and the St. Lawrence Rivers. The 96 acre mill site was originally a tidal flat that was built up by pumping two million cubic feet of sand from the river bottom into an enclosure behind a retaining wall at the water's edge. Part of this wall was built of concrete to form a wharf, 1300 feet long, large enough for ocean-going ships, which is used for receiving sulphur, coal, limestone etc. and for shipping out the finished newsprint. Seven thousand piles were driven to support the building foundations.

The organization comprises five associated companies as follows: Anglo-Canadian Pulp and Paper Co., Ltd.; Northeastern Paper Products Ltd.; St. Charles' Transportation Co., Ltd.; Forestville Realties Ltd.; Le Compagnie Le Parc St. Charles Ltée.

The Anglo-Canadian mill at Quebec consists of a Sulphite pulp mill, groundwood mill, newsprint mill with four fourdriniers, a boardmill with one six cylinder machine and a pulp drying division with two Kamyr presses.

Pulpwood Supply

The present daily wood requirements at Quebec are approximately 1350 cords which are obtained partly from the companys limits of approximately 3500 sq. miles and partly purchased from farmers and other owners of private woodlands.

Like most of the other large pulpwood users, Anglo-Canadian purchases substantial amounts of pulpwood from small producers even though their own limits could be made to supply more than their present requirements. This policy of wood purchasing from farmers, not only allows the company to conserve its woodlands for future use and maintain a larger reserve but it also encourages the woodlot owners to grow and cut more pulpwood, promotes good forestry practices and raises the local economic level by adding to the cash income of the farmers in the area.

Most of the company cut wood comes from the vicinity of the Sault-au-Cochon River which flows into the St. Lawrence about 180 miles east of Quebec. The logs are floated to this river from the numerous creeks flowing into it and then floated down to the junction with the St. Lawrence where they are stored in a large holding ground at Forestville, from where it is loaded into cargo boats for delivery to the mill.

The principal species used at the mill are spruce and balsam with a small percentage of pine. All of the wood is cut into four foot lengths.

Formerly the pulpwood was delivered to the mill only from late spring to early fall. Consequently the woodyard storage capacity at the mill had to be sufficient to supply the mill during the winter months. The barking drums were recently enclosed to allow winter operation so at present the wood is being delivered all year round.

As the wood is unloaded at the wharf it is carried directly by conveyors to the four 12 feet by 45 feet Canadian Ingersoll Rand barking drums. After the wood has passed through the barking drums it is carried by conveyor to one of the six barked wood storage areas. Four of these yards have capacities of 25,000 cords each with the other two holding 23,000 and 19,000 respectively.

When the wood is reclaimed from the storage areas it is carried by conveyor to the two washing drums. One of these drums is similar to the regular barking drums and the other is a Waplan Swedish designed drum built by Canada Iron Foundries. This drum is the same size as the others, 12 ft. dia. by 45 ft. long but it has two new and unusual features. First, the drum is supported hydraulically. Two steel tires about fifteen inches wide rotate in troughs where they are supported by water at 15-20 PSI pressure. The advantage of this type of construction is decreased wear and lower maintenance costs. The second unique feature is the absence of rings and all other obstructions on the inside of the drum.

From the washing drums the wood passes over a sorting table where it is directed to the groundwood mill or to the chippers for the sulphite mill.

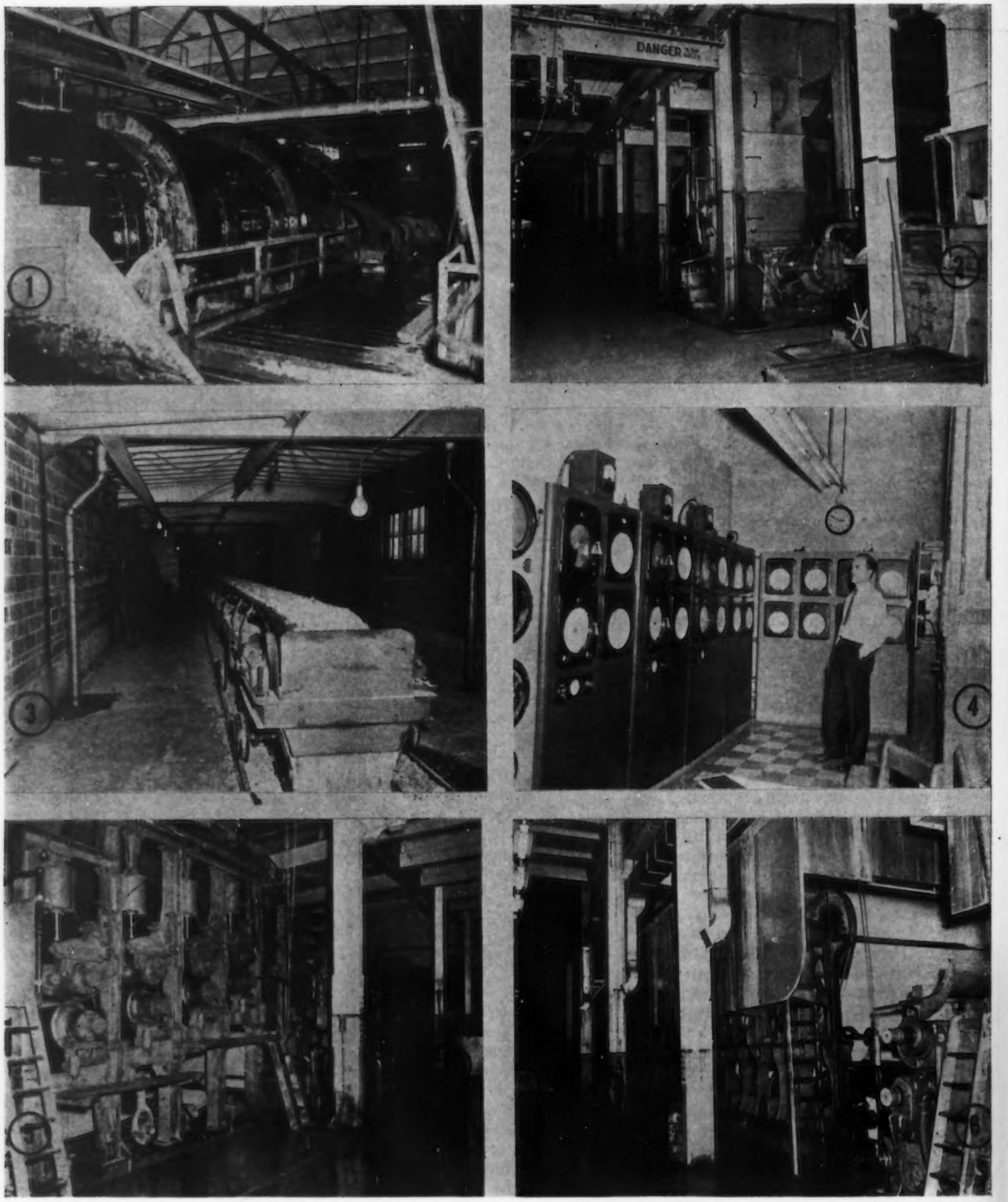
Groundwood Mill

There are 28 Waterous magazine type grinders, twenty-six of which are equipped with stones 54 inches wide by 62 inches diameter. These grinders are divided into 13 pairs of two each. Each set of two grinders is driven by a 2600 H.P. motor.

The two newest grinders have stones 54 inches wide by 65 inches diameter. These two are driven by a 5000 H.P. synchronous motor and are equipped with larger and more powerful pressure feet to obtain much higher production.

The two larger grinders each pro-

Figure 1—Waplan Barking Drum. Figure 2—Grinder Room. Figure 3—Shartle Conveyor over Chip Bins. Figure 4—Digester Control Room. Figure 5—Wet End of New Six-Cylinder Board Machine. Figure 6—Dryer Section of New Machine.



duce a maximum of about 35 tons per day as against a maximum of 22 tons per day for each of the smaller grinders. The average daily total production of groundwood is about 600 tons.

The groundwood is screened on 9 primary Cowan screens with the rejects going to two Cowan tailing screens. Accepted stock is thickened on eight American and one Sherbrooke Vacuum filters. Thickened stock goes to a storage chest and thence to the newsprint machines.

Sulphite Pulp Mill

Wood for the Sulphite mill goes from the sorting table in the woodroom, by conveyor, to the chippers, from which the chips pass directly to the three Waterous inclined, vibrat-

ing, chip screens. Accepted chips are carried on a belt conveyor up to the chip bins above the digestors.

When three new digesters were recently installed, an addition was built on the digester house, including additional chip bins.

The new digester building addition is steel frame and brick construction 30 feet wide, 75 feet long and 125 feet high. To supply chips to the new digesters a shuttle conveyor was also installed. This belt conveyor runs in either direction so that it may deliver chips to any of the bins over the entire length of the digester house.

The three new digesters are the same size as the five old ones but are of welded construction whereas the old ones are riveted. Each is 54 feet high by 16 feet diameter, with a volume of 7000 cubic feet.

All have ceramic linings installed by Stebbins. Each digester produces about 16 tons of B. D. pulp per blow or 50 tons per day, with a total daily production for all digesters of 400 tons.

The pulp is blown into any of seven blowpits all of which are connected to a vomit stack packed with 6 inch partition tile. Three of the blowpits are tile lined, each holding 1¾ blows or about 28 tons of pulp. Two others are Stainless steel lined, each holding two blows or about 32 tons of B. D. pulp. The two largest pits are made of Douglas Fir and each holds 2¼ blows or 36 tons. All of the pits are equipped with perforated false bottoms for washing the pulp.

The Douglas Fir pits as well as the stainless steel and tile linings in the other pits are recent installations. The new Blow pit room is 75 feet long, 72 feet wide and 40 feet high.

Washed pulp from the blow pits is pumped to the four Jonsson Knotters from which the accepted stock flows to five primary Cowan rotary screens. The rejects are returned to the digesters. Accepted stock from four of the primary screens is sent to the sales Sulphite system.

Rejects from the four primaries pass to another pair of Cowan rotary screens from which the accepted stock goes to the news system and the rejects go to a pair of Waterous rotaries. The accepted stock again goes to the news system and the tailings pass through a 20 inch Sutherland refiner and then go to a decker where they are thickened for use in the board machine for wrapper etc.

Screened stock for the sales sulphite system is thickened on three parallel units consisting of a Lindbladt vacuum filter, a Sherbrooke vacuum filter and a Lancaster type decker. Stock from all three machines goes into the sales sulphite storage chest.

Sulphite Liquor Making

The addition of three new digesters produced a 60% increase in the cooking liquor requirements and made necessary the expansion of the liquor making facilities. The new steel frame and tile addition to the acid plant is 54 ft. wide, 82 ft. long and 40 ft. high.

New Acid Plant

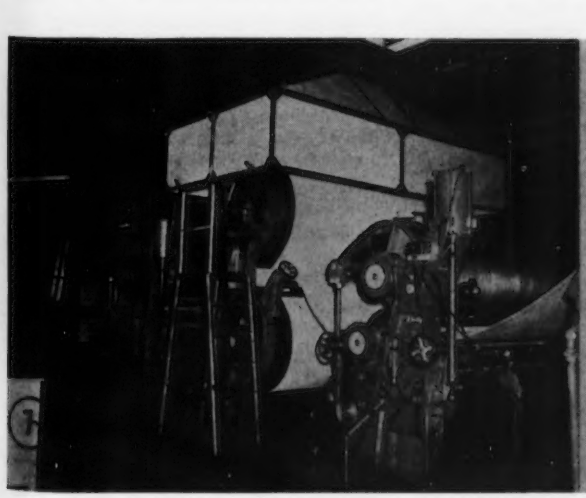
Sulphur Melting Equipment, includes one 8 inch by 5 inch bucket elevator with manganese bronze buckets on rubber faced belt, with a capacity of 10 tons sulphur per hour; one 14 inch diameter screw conveyor to move sulphur from elevator to storage hopper; one ¼ inch steel plate storage hopper with a capacity of 90,000 lbs. sulphur; four, vertical tubular melters, 10½ feet high, and rated at 30,000 lbs. sulphur per day each; one steam heated decanting trough with overflow screen; one ⅜ inch steel tank lined with 3 inch firebrick lining separated in two compartments with total storage capacity of 50,000 lbs. liquid sulphur.

Instrumentation for this unit consists of one indicating type air operated controller to regulate steam supply to melters; one indicating type air operated temperature controller with air operated valve used as safety overflow control on liquid storage tank; and one recording type, air operated temperature controller with air operated valve to control temperature of liquid sulphur in storage tank.

Sulphur Burning Equipment: consists of one 5.0 diameter by 16 feet long rotary vaporizer, lined with 6 inch cupola block; one set of tandem type combustion chambers each 12 feet ID by 16 feet high; Shells are lined with two layers of asbestos paper and the primary chamber is lined wtih 2½ inches insulating brick and 6 inch cupola block lining. Secondary chamber is lined with 6 inch cupola brick lining only.

Instrumentation includes one Brown radiomatic temperature recorder on discharge from combustion chambers; and one Micromax SO_2 analyzer controller with electric operated valve on secondary air intake.

Gas Cooling equipment includes one mild steel primary spray cooler 8 foot in diameter by 15 feet and 3 inches high ⅜ steel plate lined with 3/16 inches lead and 9 inches acid resistant brick lining; one secondary cooling tower of type 316 stainless steel, 7 feet 6 inches in diameter by 29 feet and 8 inches high and shell thickness 3/16 inches, Tower packed with 10 feet of 6 by 6 inches chemical stoneware partition rings and fitted wih type 316 stainless steel nozzles; one multiple



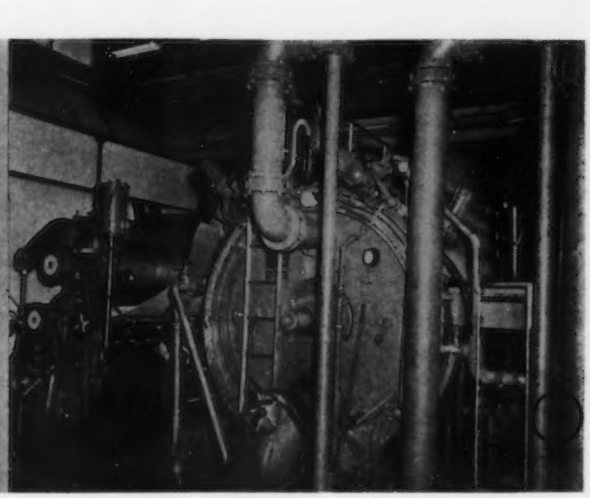


Figure 7—Kamyr Predryer and Press Section. Figure 8—New Kamyr Forming Section.

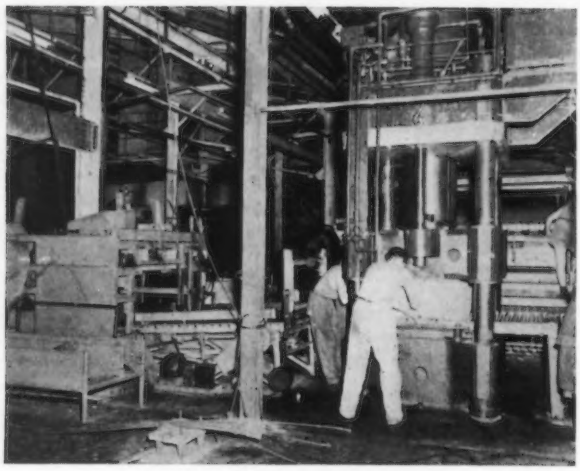


Figure 9—Pulp Baling Press.

section heat exchanger of type 316 stainless steel.

Instrumentation consists of temperature recorder with internal electrical control to shut down gas fan; temperature recorder recording temperature of solution out of primary cooler; one indicating type pressure controller with stainless air operated control valve for admitting emergency water to primary cooler—used as safety device on primary cooler.

Acid Tower: A third tower was built to supplement the existing two units. The three towers will be operated on the counter-current principle. The new unit is a 10 foot 6 inch ID reinforced concrete tower, 90 feet high, tile lined, with vitrified segment block tile 2½ inches thick. Racks are made of white oak and are supported on granite columns. Columns are doweled with stainless steel pins. Tower is fitted with hard lead and acid bronze fittings.

Pressure Recovery Tower: One 5 feet ID by 50 feet high tower was constructed of mild steel welded plates and has a maximum operating pressure of 14.5 lbs./sq. inch. It is lined with 3 inch acid resisting brick on walls and dome. Fittings are hard lead inserts grouted into lining, and tower is packed with 33 feet of chemical stone partition rings. Acid is distributed through a type 316 stainless ring and four durimet "20" nozzles.

Instrumentation includes one recording level controller, one extra liquid recorder and one type 316 stainless 4 inch air operated control valve for maintaining the level in tower.

One recording pressure controller, with extra instrument, and a four inch, type 316 stainless, air operated, valve is used for controlling pressure in tower.

One recording type flow meter, with extra instrument, is used for metering acid pumped from raw acid storage to recovery plant.

Low Pressure Acid Storage: Existing 18 feet by 34 feet acid storage vessels were hooked in parallel to have both operate as low pressure acid storage vessels.

Instrumentation consists of one air operated recording controller, with extra pressure recorder, for controlling pressure.

A level controller, recorder, with extra recorder, is used to control level in vessels, by means of air-operated type 316 stainless valve in inlet.

High Pressure Acid Storage consists of one welded high pressure vessel 26 feet ID by 46 feet high lined with 7½ inches thick acid resistant brick. It was designed for a working pressure of 60 psi at top nozzle (normally operated at 45 psi. Nicknamed the "Blimp." Capacity 105,000 gallons.

Instrumentation includes one level recording instrument, complete with extra liquid level recorder; one recording type air operated pressure controller, with extra pressure recorder and one 4 inch type 316 stainless air operated valve for controlling vessel pressure; one six-point multi-record temperature recorder with three bulbs and three type 316 stainless sockets for recording acid temperature at various stages.

Newsprint Mill

There are four Walmsley Fourdriniers, each having a wire 80 feet long by 234 inches wide, all of the fourdriniers have pitched wires. Each machine is equipped with four Bird screens.

Each machine has a suction couch, two suction presses and one plain press. The dryer sections have 45 dryers, each five feet in diameter.

All of the machines are equipped with Harland sectional electric drives. The dryer gears on number four machine were recently replaced with a set of fully enclosed gears, allowing the speed to be increased. The present maximum is 1560 FPM as against 1425 FPM on number three and two and 1400 FPM on numbr one.

The average total newsprint production is 725 tons per day.

Board Mill

In 1950 a new six cylinder board machine was added. This machine was designed and built by John Inglis Co., Ltd., for a production of 50 tons of board per day. The average production now is 65 tons per day with a top production of 70 tons on mill wrapper. The machine trims 124 inches and has speed range of 50 to 250 feet per minute.

Stock Preparation

The board mill is equipped with an elaborate stock preparation system to furnish blends of stock for the top liner, filler, and bottom liner.

Five different grades of pulp may be used at any one time for making different blends. Various kinds of pulps used, include groundwood and sulphite screenings, sulphite pulps, and several types of waste papers.

Tailings from the Sulphite and groundwood mill screening systems are thickened in their respective deckers and then sent through regulators before passing through one of the three Jones Refiners and thence to the storage chests. Overflow from each decker goes to a wet machine to be lapped for storage.

Each of the Jones Refiners is equipped with a 100 HP motor rotating at 1200 RPM. These machines brush out the coarse fiber bundles and are piped so that they may be arranged in parallel or two may be put in series. Normally they are all operated in parallel with two being used for groundwood secreenings and the third on Sulphite screenings.

There are four cylindrical wooden tanks with sloping concrete bottoms used for storage of refined sulphite screenings, groundwood screenings, filler stock and miscellaneous stock. Each chest is approximately 18 feet high by 11½ feet diameter. A fifth tank, which is slightly larger, being 20 feet in height, is used for No. 1 sulphite pulp. Each chest is equipped with a Sherbrooke vertical agitator, driven by a 7½ HP motor.

Waste paper stock as well as lapped or baled pulps are defibered in the Fleck-Cowles Hydrapulpers. There are two of these machines, one being 10 feet in diameter with a capacity of 1000 lbs of stock at 4½% consistency

and the other is 14 feet diameter with a capacity of 2000 lbs of stock at 4½% consistency.

Both of these machines have gear reducers and multiple V-belt drives, the smaller unit being driven by a 100 HP 1200 RPM vertical motor and the larger machine has a 150 HP, 1200 RPM horizontal motor.

The discharge screen plates are bronze with one inch perforations. Dump valves are air-operated.

Stock from the smaller hydrapulpers is pumped to the miscellaneous stock tank and from the larger hydrapulper the stock goes to the filler storage chest.

Broke is disintegrated in a Jones Liebeck pulper, which is located in the basement below the rotary cutter at the dry end of the machine. Broke is fed to this machine through an opening in the operating floor. The Liebeck Pulper consists of a tile-lined concrete chest, 7½ feet long by 6 feet wide having a horizontal shaft fitted with two propellor agitators of opposite pitch. The shaft is supported in external anti-friction bearings and is driven through V-belts by a 75 HP 900 RPM motor.

Defibered stock passes through a bronze screen with ½ inch perforations and then goes through a consistency regulator before being sent to the filler stock chest or filler machine chest.

Most of the work on the stock is done in the Hydracycle systems. There are three identical systems, supplied by Alexander Fleck, Ltd., which are used to prepare the stock blends for top liner, bottom liner and filler respectively. Each system consists of a cylindrical tile stock chest approximately 11 feet in diameter by 20 feet high with a Hydrafiner connected so that the stock circulates from the bottom of the chest, through the Hydrafiner and back into the top. Each of the Hydracycle tanks holds 2000 lbs of stock at 3% consistency which is constantly mixed by a 42 inch Diameter adjustable blade, Horizontal propellor agitator, driven by a 20 HP, 1800 RPM motor through a Cleveland reduction gear.

The Hydracycle tanks are located on a mezzanine above the board mill operating floor. Each Hydracycle system is furnished with the various kinds of slush stocks by pumping them from the storage chests up to the top of the Hydracycle tank.

With these systems it is possible to furnish the stocks in the order of their beating requirements. That is, the stock needing the most treatment is added first and circulated through the Hydrafiner until it has sufficient extra beating before the next stock is added, and so on until the blend is complete.

When the treatment is sufficient, the stock from each Hydracycle tank is dropped into its respective machine chest through an air operated dump valve. These chests are built of reinforced concrete, 23 feet long by 13 feet wide and are rectangular in cross-section, with a midfeather. Each is equipped with a 42 inch diameter, propellor type Miami horizontal agitator, driven by a 15 HP, 1800 RPM motor through a Cleveland reduction gear.

Stock from each machine chest is pumped to its respective machine jordan from where it flows into the regulating headbox. All three jordans are arranged so that they may be bypassed, and the top and bottom liner jordans are piped up so that they may be used interchangeably.

The jordans are all identical Miami number one machines equipped with anti-friction bearings and driven by 150 HP 450 RPM synchronous motors.

Stock Blending

The regulating headbox, which is located on a balcony above the screens, is divided into three separate compartments, one for each of the three kinds of stocks going to the machine. Each compartment is two feet wide, 9½ feet long and 3½ feet high and is made of stainless steel. The bottom of each box is sloped to one side to feed stock into the six stock gates leading to the six cross pipes which flow into the screens and thence to each of the six vats. Thus each of the three compartments can supply stock to any or all of the six vat systems.

Stocks flow through the gates and into the cross pipes by gravity and are diluted with machine white water before passing to the screens.

Instrumentation and Controls

The overflow dam in each compartment is equipped with remote controls so that the rate of flow stock to the vats may be controlled from the panel on the operating floor.

Practically all of the instruments and operating controls for the board mill are grouped in a set of five instrument panels located across the aisle from the middle of the board machine.

In addition to the Fleck controls for positioning the overflow dams in the regulating box, there are also: liquid level recorders for the white water tanks Hydracycle tanks, machine chests and the stock storage chest; controls for the Hannifin air operated valves that regulate flows of five kinds of stock as well as liner and filler white water to the Hydracycle tanks, also controls for dump valves of all chests and controls for flow of stocks to the Hydrofiners.

Controls and recorders for the pneumatic loading devices on the presses are one of the remaining panels and the other contains steam flow and pressure meters for the drive turbine and the dryers, as well as recorders for the pneumatic loading on the calenders.

Thus, it has been possible to concentrate almost all of the controls and instruments in a single convenient location which not only simplifies the work of the machine crew but also allows a much closer control of the machine variables.

Stock Screening and Distribution

Stocks in the six cross pipes are thoroughly mixed with measured flows of white water from the vat circulating pumps and flow to the screen headboxes and thence to the Jonsson screens.

Screen headboxes are constructed of steel plate and lithcoted. There are six of these vibrating screens, one for each of the six vat systems. They were built by Canadian Ingersoll-Rand and each is driven by a 3 HP, 1800 RPM motor through V-belts. The screen frames, wires and perforated plates are made of stainless steel. All other parts in contact with stock are lithcoted.

Accepted stock from each Jonsson screen flows into troughs, where it is further diluted with regulated amounts of white water from the circulation pump, as it flows into the mixing boxes. These stainless steel boxes, are 24 inches wide, 44 inches long with rounded ends, and 54 inches high. They are located on the operating floor level in back of the machine, each one opposite its respective vat and connected to it at the bottom by a 12 inch diameter stock pipe.

Board Machine—Vats

The six counter-flow vats are equipped with bronze cylinders, 36 inches diameter by 138 inch face. Couch rolls are 19 inches diameter with 142 inch face and have a 1½ inch rubber covering. Both cylinder and couch rolls are supported by enclosed anti-friction bearings.

Stock sections of the vats are equipped with quick-opening dump valves and washout gates at each end.

Water from bottom liner and underliner vats 1 and 2 and top liner and underliner vats 6 and 5 may be pumped by the circulation pumps to either the liner or filler white water tanks. Water from filler vats 3 and 4 goes to the filler white water tank.

The circulation pumps are piped up to deliver white water to the mixing boxes, screens and screen headboxes, cross pipes in the regulating box and the white water tanks.

Sheet Pickup and Water Removal

After the last pulp is picked up on the bottom felt, the combined sheet passes through an open extractor press built by Dominion Engineering Co. The bottom roll of this press has a bronze frame covered with bronze wire mesh and is 24 inches diameter by 144 inch face. The top roll is 19 inches diameter by 144 inch face and has a 1 inch rubber covering on a hollow cast iron core.

The felt turning roll is 16¾ inches diameter by 148 face and is covered with a ⅜ inch hard rubber covering.

The top roll is equipped with lever arms for weighting.

Primary Presses

The primary presses consist of two pairs of 14 inch diameter rolls, one pair of 16 inch diameter rolls and one pair of 18 inch diameter rolls, in that order as the sheet passes through top rolls have 142 inch face widths and bottom rolls have 144 inch face widths. All have cast iron cores with ¾ inch rubber coverings.

Journal shafts of number 3 and 4 bottom primary press rolls are extended on the drive side and are connected to helper drives through half-jaw couplings.

Slices are wooden with steel journals and levers for applying pressure. Each press is provided with a copper save-all tray which discharges to gutters on the back side of the machine.

Main Presses

There are two main presses, separated by a pair of pre-dryers. Both top rolls have cast iron cores covered with ⅝ inch brass shells and are 24 inches diameter with 142 inch face. Each top roll is equipped with a Lodding oscillating doctor. Bottom rolls are also 24 inches diameter but have 140 inch face and have ¾ inch rubber coverings on cast iron cores. These presses are equipped with savealls similar to those on the primary presses.

The pre-dryers are 48 inch diameter with 138 face, and are equipped with Lodding Oscillating doctors.

All presses, both primary and main, are loaded by pneumatic cylinders whose pressures are controlled and recorded on a section of the main instrument panel, previously described.

The felt rolls have steel cores with ¼ rubber coverings. The regular support rolls are 9⅛ inches diameter. Larger rolls, 11¼ inches in diameter are used, in positions adjacent to the whippers.

For cleaning, each felt is equipped with shower pipes and suction boxes and the top and bottom felts each have a whipper. The second press felt has one two inch shower pipe which sprays the felt before it passes over the suction box which consists of a length of six inch brass pipe having a slot 138 inches long by ¼ inch side. Edges of the slot are rounded to reduce wear on the felt as it passes the opening under tension. This suction box and shower are used intermittently.

There are two two-inch shower pipes on each of the top and bottom felts, located on each side of the felt near the whippers. The felt travels from whipper to suction box.

Whippers are all steel, triple arm, 15 inches diameter, supported in Ryertex bearings which are adjustable toward or away from the felt on both ends.

Dryer Sections

The 49 dryers are in two groups, 26 in the main section, three rolls high and 23 in the other section, stacked six high. The paper dryers are 48 inches diameter with 134 inch face and the two felt dryers are 48 inches diameter with 138 inch face. The dryers are designed to use steam at 50 PSI and are equipped with Johnson steam joints. Pusey Jones dual revolving syphons are used for condensate removal.

Dryer bearings are bronze sleeve type with collar oiling, except the felt dryer bearings which are self-aligning and anti-friction. One of the auxiliary rolls is a 16 inch diameter receiving roll between the second press and the first dryer.

This is a steel roll with ¼ inch rubber covering. Felt rolls are of steel, 8 inches in diameter and set in anti-friction bearings.

Each of the last two top dryers is equipped with a rider roll to prevent runback of the sheet when a break occurs at the first stack. These are steel rolls, six inches in diameter

A 12 inch diameter steel spring roll with anti-friction bearings is located between the last dryer and the first calender stack.

The entire dryer section from the receiving roll to the last dryer is equipped with a Sheahan rope carrier system.

The hood was designed by Anglo engineers and built by their own construction crews. Frames and panels are aluminum with removable side panels. The roof sections are insulated with rock wool. Ventilation is provided by five ventilators each equipped with a 42 inch fan, driven by a three HP motor.

Separate aluminum hoods and ventilators are provided for the pre-dryers, the cylinder section and the calenders. Each of these is ventilated by a 32 inch fan driven by a 1½ HP motor.

Calenders

Like most board machines, this one is equipped with wet and dry calender stacks. The wet stack has five rolls with diameters as follows from bottom to top, one 24-inch; one 16-inch; two 12-inch and one 16-inch.

The dry stack is similar except that there are six 10-inch instead of the two 12 inch intermediate rolls. All rolls in both stacks are equipped with sleeve bearings. Bottom roll bearings are babbitt lined and all others have bronze sleeves. All rolls are equipped with Lodding doctors.

Both stacks have motor driven roll lifting devices and are equipped with Foxboro Pneumatic roll loading system which are controlled from the main panel. The wet stack has four water boxes.

Sheet Cutter

The machine is equipped with a Hamblet Duplex cutter between calenders and reel. Duplex slitters allow sheets of varying widths up to a total of 128 inch trim to be produced. Duplex cutters provide a wide variation in lengths and allow production of two different lengths simultaneously.

Brake drums are mounted on the front journals and the back journals are extended into half-jaw couplings to connect with the drive shafts.

The slitter-winder was designed by Pusey Jones and built by John Ingles Co. It is a conventional two-drum surface winder with rider roll.

The grooved winding drums are 15 inches diameter by 138 inches face width. The rider roll is 10 inches diameter by 138 inch face and is raised or lowered by a handwheel through a counter-weighted chain and sprocket gear mechanism.

The winder shafts are carried in babbitt lined guide slots and are raised or lowered by a handwheel through a counter-weighted mechanism similar to that used for the rider roll.

A maximum of eight shear-cut slitters may be used to produce any size rolls up to a maximum total trim of 130 inches.

All winder bearings are anti-friction and the unit is driven by a wound rotor AC motor through cone and flat belt pulleys to counter shafts and then by V-belts to the winder drums.

Machine Drive

The prime mover which is located in the basement below the machine, is a Moore, 175 HP, single stage, noncondensing, steam turbine equipped with a Worthington double-helical reduction gear. The speed ratio is 12.5 to 1 giving a top output speed for the reducer of 360 RPM at the maximum

turbine speed of 4500 RPM. Steam is supplied to the turbine at 390 PSIG, 600°F.

The turbine is connected near the center of the lineshaft which is 4 7/16 inches diameter and runs the entire length of the machine. The lineshaft is supported on pillow blocks equipped with SKF self aligning anti-friction bearings.

Power is transmitted from the line shaft to the drives on the operating floor by means of seven pairs of pulleys one for each of the following machine sections: Main 1st press and primary press helper drive; second press and pre-drive; dryer section; wet calender stack; dry calender stack; cutter reels. The reel drive pulleys are crowned, all others are cone pulleys for speed adjustment. Each section drive includes a belt shifter for changing draws, an airflex clutch and a Falk right angle reduction gear connecting to the machine.

Boilers

All of the steam requirements for the mill are normally supplied at 400 psig by three Babcock and Wilcox Boilers and one fairly new Combustion Engineering boilers.

There is also a 200,000 lb. per hour electric boiler installation which is operated only during the high water season to utilize excess power produced by Shawinigan Power Co. During this period one of the regular boilers may be shut for overhauling.

The three B. & W. boilers each produce a maximum of 85,000 lbs. of steam per hour at 400 p.s.i.g. 600°F.

Taylor underfeed stokers are used to burn Anthracite coal.

The C E Boiler has a capacity of 200,000 lbs. of steam per hour and also burns anthracite coal but in pulverized form with tangential firing.

Although this boiler is now tied in with the others and operates at 400 p.s.i.g. and 600°F, it was designed for operation at 900 p.s.i.g. to allow for future adoption of that operating pressure.

The size of this boiler, 16 ft. square by 44 ft. high, is comparatively small for the high production of steam. This is made possible by the use of tangential firing, a method where by the powdered coal and air are blown from each of the four corners on a line tangent to a small imaginary circle in the center of the combustion zone. The swirling effect thus produced, causes thorough mixing of fuel and air and thus promotes very rapid combustion in a small space.

The coal and air nozzles may be tilted up or down to raise or lower the combustion center. Since the storage capacity of the existing coal bunker was insufficient to supply the additional requirements a new bunker was built above and in front of the new furnace. Coal is fed into the old bunker with a skip hoist and then transferred to the new bunker by means of a belt conveyor.

A pair of Raymond Pulverizers reduce the coal to powdered form suitable for blowing into the furnace.

A Nuveyor pneumatic ash removal system was installed to handle the ash from the powdered coal. Facilities for removing ash from the B. & W. boilers were also provided with this system.

Electric Power

Although this mill, like all newsprint mills, has very high power requirements, yet only a small proportion is generated in the mill by one Westinghouse 7500 KVA turbo generator. The turbine uses steam at 400 psig, 600°F and exhausts at 50 p.s.i.g. The generator produces three phase, 60 cycle AC at 2200 volts. About 50,000 KW per hour is purchased from Shawinigan Power Co.

Pulp Dryers

Sales sulphite pulp is formed into sheets for bailing on two Kamyr pulp machines, one of which has been in operation for only a few months. Both machines trim the same width 94 inches. The older unit is equipped with a Flakt Dryer which allows the production of pulp above 90% A.D.

The new machine produces pulp which is not more than 54% B.D. However a Flakt Dryer will soon be installed on this unit so that the entire output may be dried to 90% A.D. or better.

Each Kamyr unit consists of a forming cylinder followed by a press which is pneumatically loaded. The sheet then passes over two dryer rolls before going to a second press which is also pneumatically loaded. On number one machine the sheet then goes into the Flakt Dryer and thence to the sheet cutter and baler.

On number two machine the sheet goes directly from the second press to the sheet cutter and the baler.

Equipment and Suppliers

New Acid Plant

Canada Iron Foundries, Waplum barking drum; Paper Machinery Co., (Hellstrom), Rosenblad Heat Exchanger, Kamyr Pulp Machine, Kraft Paper Dryer; Horton Steel Co., High Pressure accumulator (blimps), News Digesters; Canadian Stebbins Eng. Co., Digester linings; Jenssen Co., Acid Plant; Eastern Canada Steel Co., Structural Steel; Dominion Bridge Co., Structural Steel; Combustion Engineering Co., 200,000 lbs./hr. Boiler

Board Mill

Shawinigan Stainless Steel and Alloys Co., Mixing Boxes; Alexander Fleck Co., Hyracycle system, Hyrapulpers, pumps, agitators, Stuff Boxes, Hydrafiners, Miami Jordans; Sherbrooke Machineries Ltd., Agitators; Hamblet Machine Co., Rotary Sheet Cutter; John Inglis Co., Board Machine and Auxiliaries; Canadian Stebbins Eng. Co., Stock Chests, Hydrocycle tanks.

Pusey Jones Co., Dryer Roll Syphons, Board Machine Design; E. D. Jones Co., Lubick Pulper, Jones Refiners; Canadian Ingersoll Rand Co., Jonsson Screens, pumps; Johnson Corp., Steam Joints (Dryer Roll); Foxboro Corp., Instruments, pneumatic loading; Republic Flow Meters Co., Instruments.

Customs Court Cases

New problems involving the dutiability of various types of paper continue to come before Customs officials, according to Warren B. Bullock, manager of the Import Committee of the American Paper Industry. Among the recent new problems are the following:

The dutiability of pulpwood made from bleached straw is under investigation.

Greeting card stock in which flower petals or butterfly wings are laminated to the paper with a surface lacquer.

Mulch paper for protection of growing Hawaiian pineapples has been claimed to be duty free as agricultural implements, but on the advice of the Import Committee will be classified at 30 percent as paper not specially provided for.

After many years importations of bowl paper have been resumed. This paper compressed into calender rolls for use in the textile industry has hitherto been classified as paper not specially provided for.

Rhinelander Expansion and Modernization

Semi-Chemical pulp and a variety of papers therefrom are soon to be produced in the "Hodag country" of northern Wisconsin when the most recently announced phase of Rhinelander Paper Co.'s six and a half million dollar expansion and modernization program is under way.

All of the equipment for the semi-chemical unit has been ordered and most of it is on the site ready for installation, according to Ben Cancell, operations vice-president of this widely known mill which manufactures bleached and unbleached glassine in various grades, greaseproof papers, and a very wide line of special combinations in those and allied fields.

In its Mill Number last September, *Paper Trade Journal* noted briefly some earlier phases of the present Rhinelander capital investment program and concentrated on the then relatively new yeast plant.* The work therein outlined, revolving chiefly around the new No. 8 machine and basic changes in the power department, have now come to completion. The semi-chemical unit, as well as a completely new evaporator system as an important step in Rhinelander's steady stream improvement history, are in addition.

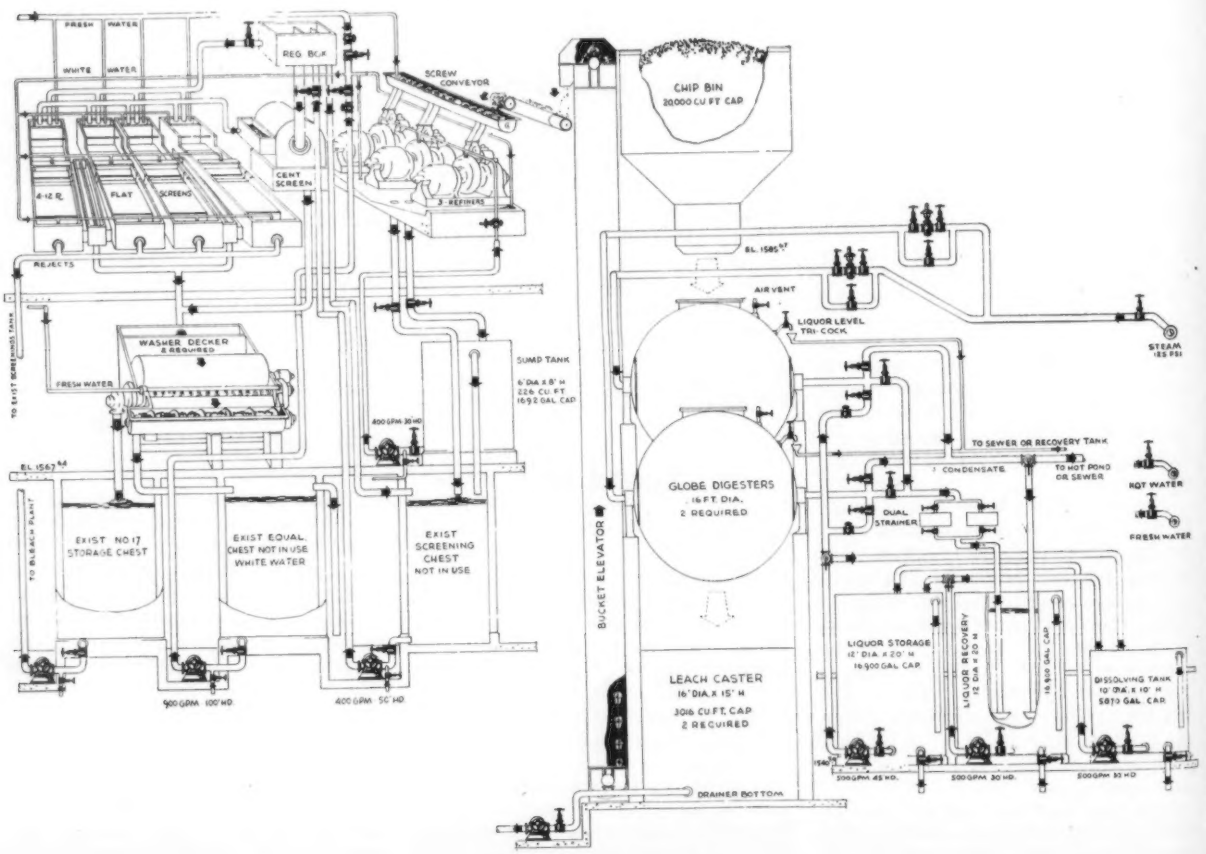
Digesters and Refiners

The start of the semi-chemical production, which will be primarily from aspen of which good inventories are already in the Rhinelander yard, is to be in a pair of 16-foot spherical rotary digesters built by Ohio Machine and Boiler. The quick-cook stock will drop into specially designed leach casters provided with a specifically designed chip gate. Conveying of chips will be by Link-Belt system hooked to Reliance electric screw-feed conveyors. These are proportional conveyors with magnetic separators and they will lead to three Bauer refiners, each equipped with two 250 hp. forced ventilated motors.

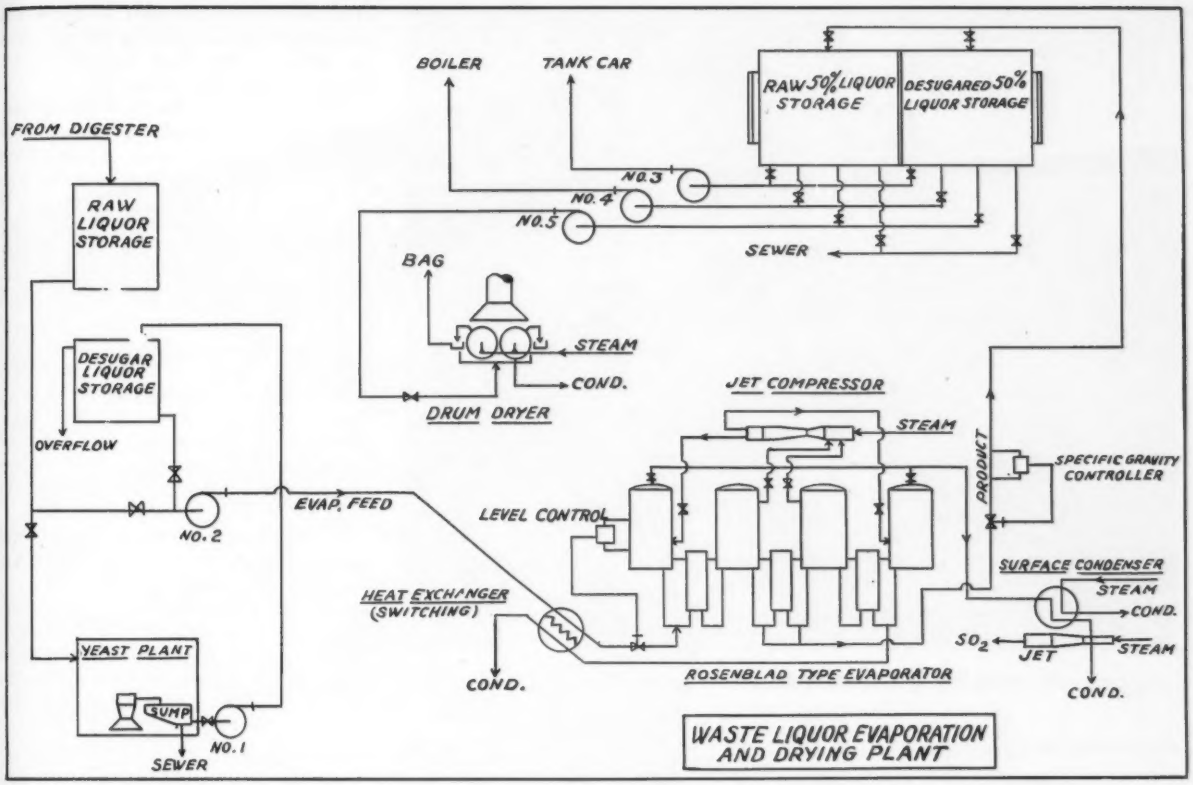
The refiners are to be arranged to operate in straight or parallel series. From them the chip stock will drop into a small receiving chest and be pumped therefrom to a Cowan screen with Lithcoted interior and plates. Tailings from this screen will be taken over four 12-plate Valley Iron flat screen beds arranged in two 24-plate lines parallel. The stock then proceeds over a 6′6″ by 14′ Impco valveless vacuum decker.

From the decker the semi-chemical stock will be pumped over to the bleaching plant and fed into a proportioning system where it will be combined with regular sulphite stocks, in varying proportions according to the characteristics of the sheet required. Rhinelander officials point out that

* "Rhinelander's Yeast Plant" and "Rhinelander Present Expansion and Modernization Program," September 7, 1951, *Paper Trade Journal.*



Flow Sheet Semi Chemical Plant.



prior tests of the system indicate excellent strength with the introduction of the semi-chemical poplar woodpulp.

Semi-Chemical Unit for Glassine

The semi-chemical unit at Rhinelander is believed to be the first programmed in the glassine industry. Another "pioneer" improvement in the present modernization is the Conkey 4-body triple effect General American-Rosenblad evaporator system for evaporation of standard calcium base sulphite waste liquor. This will be hooked into the existing yeast plant operations as indicated in the accompanying diagrams which show both the yeast plant flow and the approximate layout of the evaporator system now being installed at the site of the old turbine rooms of the mill.

The system will be capable of handling waste sulphite liquor direct from the digesters or effluent from the yeast plant which has been de-sugared. In conjunction with that project, it is planned to install equipment for conservation of sulphur in the form of SO_2 from waste sulphite liquor prior to the evaporation or yeast plant processes. Liquor drained from the Mitscherlich digesters will be passed to a separator where the SO_2 gasses or SO_2 will be introduced to a recovery tank for absorption. Stripped waste will then accumulate in a tank from which it can be used to feed blow pits and furnish a supply for the evaporation and yeast processes.

Another feature worth noting in the Rhinelander stream improvement program is the installation of a new flotation type Svalla saveall built from the much discussed Swedish designs. This operates on the vacuum flotation principle, enables re-use of water and results in considerable stock restored to the machine. Improvements by a factor of two-thirds have already been reported on this equipment by Rhinelander technicians.

Power Plant Equipment

Extreme changes in the power department are featured in the new Rhinelander program. When the current modernization phase began there were four turbines installed, three in regular usage and one as stand-by. Only one of these turbines has been retained in the new set-up. This 4000-kw Westinghouse unit extracting at 12 pounds and equipped with eight-pass condensers arranged for heating hot water for the mill has been transferred from the old power plant site to the newly-built power department.

Discarded in the present modernization were another 4000-kw double-extraction machine, and a reconstructed unit which had formerly furnished main propulsion on a destroyer escort vessel of the Navy.

As spanking new as the building which houses it, together with the retained power plant equipment, is the Westinghouse 12,500 kw unit operating at 400 pounds pressure. This unit extracts at 125 pounds.

Notable is the fact that the retained No. 3 unit can operate suitably, without conversion, at Rhinelander's newly increased steam temperature of 700 degrees. The new Westinghouse turbine is on the straight impulse principle, now being employed successfully by that company in many of its smaller size units.

Generation of power at 12,000 volts made it necessary to install a new electrical distribution system which replaced the 440-volt system formerly in existence. Power is now distributed at 12,500 volts from the turbine room to load centers located at appropriate points throughout the mill and at these it is stepped down to 440 volts to feed the various power circuits. This is much higher voltage than used in any paper mill in the area now, and is used only in one other plant of any kind in the region at present.

Considerable savings have already been indicated in the new power plant set-up, and it is believed that more will be noted during the winter months when heretofore it has been necessary to reduce large quantities of the 125 pound process steam.

Pulpwood from (Fire Tower) looking up river away from the plant.

Engineering and Construction

A great deal of construction engineering was involved at Rhinelander in the transfer of the power department, the setting up of the semi-chemical system and evaporator unit, and the installation of the new No. 8 machine. It has been carried on with virtually no interruption of production aside from that inevitably occurring during one period in the power changes.

The new power plant housing is particularly noteworthy. It is of skeleton steel construction, featuring concrete slab floors faced with quarry tile. On the walls are Arketex glazed tile in two-tone face. The ventilating system, evolved by Rhinelander engineers, salvages heat in winter for use inside the mill. The power plant roof is of steel truss construction with concrete tile decking. Lighting is provided by high bay fixtures with mercury vapor lamps, and these are augmented in daytime by maximum use of glass-blocks in the walls. The entire building is 60 by 84 feet and designed with an eye to future expansion, including steel framing on which to base another turbine. A 20-ton overhead traveling crane is ready for repair and maintenance work here.

Due to the evaporator installation and semi-chemical equipment, considerable new steel work is evident in the old turbine room. Existing walls are being retained and much of the new steel work is to take care of the extra wall height necessitated by the evaporator layout. The roof will be wood-planked completely sprinkled.

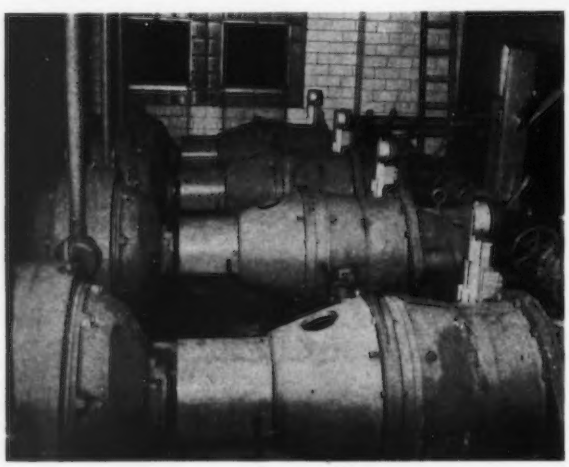
The housing of the new No. 8 machine involved basically creating a two-machine room out of a one-machine room. Consequently knocking out the old wall to the port side of the No. 5 machine was involved, and it was necessary to redesign the roof span. The machine room as it now stands features monolithic concrete construction to the machine floor level, together with appropriately located steel and trusses. In addition to the masonry, aluminum vents, glass blocks, and Wolmanized lumber went into the construction. Pent-house arrangements had to be built to take care of the Ross economizer for both the No. 5 and the new No. 8 machine.

The renovation of the machine room included areas for the installation of auxiliary equipment and of course engineering involved with the stock chests, couch and wire pits, etc. Number 5 and No. 8 are now swung into the rest of the mill at the rewind end by a very spacious foyer which sets into the main mill at a forty-five degree angle.

Earlier Phases of Expansion

Earlier phases of the current expansion at Rhinelander were completed late in 1951 and early this year. They included, in addition to the machine, E. D. Jones pulpmaster, Jones-Bertram beaters, Morden stockmakers, Impco agitators and Goulds pumps on tanks and chests tiled by Chemical Lining Co. Stock lines are of fabricated stainless.

Auxiliaries to the machine include Bird centrifiners (now on both No. 8 and No. 5) Poirier vacuum box control, Valley inlet, Midwest Fulton drier



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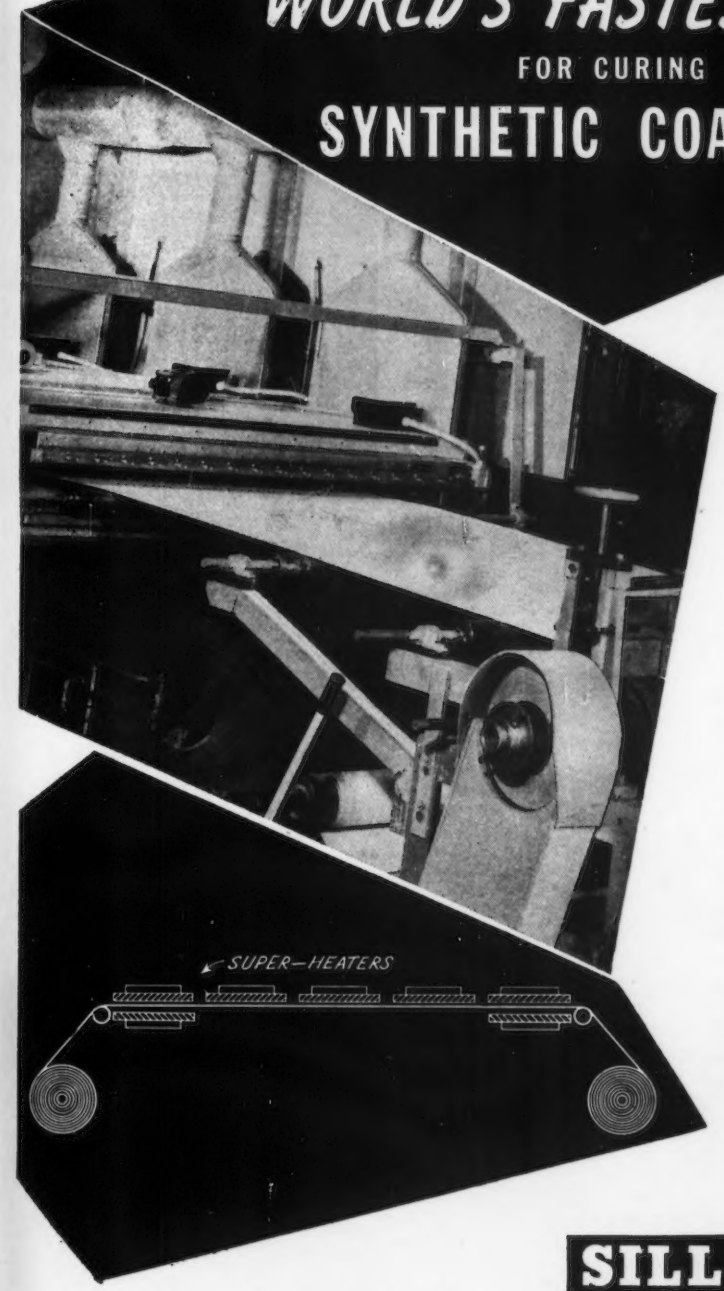

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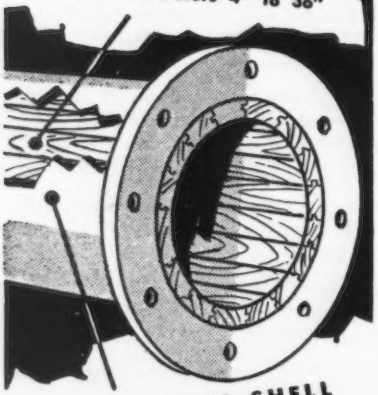

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drainage system, J. O. Ross Briner economizer and hood with the Ross-Grewin system on the dryers. The winder is Cameron and attached to a mechanical unloading device with hydraulic hoist built-in.

A new 16,000 square foot warehouse has been completed in addition to the various equipment and process improvements, and this is only half of the size of the increased warehouse facilities program now on the docket. It is expected that the addition will be completed before this year's end. Additional space will be for storage of finishing room supplies as well as for finished paper waiting shipment at the rail siding.

Number 8 has a wire 132 inches wide by 80 feet in length and the drive, as noted above, is a Westinghouse steam turbine driving directly into the line shaft from which it is belted to various sections.

Stock broken up by the pulpmaster is pumped to the Bertram beaters and therefrom through deZurik consistency regulators directly to the machine chest which has deZurik constant level controls. From the chest the stock goes through Morden stockmakers for final preparation ahead of the machine where it is further processed by a battery of Bird centrifiners, rubber covered. It is then entered into the Valley head box and inlet.

Briefly, the new machine features vacuum Poirer system; suction couch; suction press; second and third presses; reverse press; all under Beloit diaphragm loading. Temperature control is by Mason-Neilan; condensate removal by Midwest-Fulton; and rewinder by Cameron. Suction pumps are Nash, and stock pumps are Shartle or Gould.

The new No. 8 paper machine is the third new Beloit machine to be installed in the mill within the past ten years. Originally, it was planned to rebuild the No. 3 machine rather than to build an entirely new machine. However, the demand for Rhinelander products continued to be so high that company executives were reluctant to shut down the machine for rebuilding. In August, 1950, Rhinelander decided to continue the No. 3 machine in operation and to have an entirely new machine built. An addition was made to the building housing the No. 5 machine, to provide space for the new No. 8 machine. The new Beloit machine, 229' long, was started up at 4:25 p.m. on November 21, 1951.

The removable Fourdrinier is provided with a double unit Beloit high speed super shake system to provide flexibility in control of shake speed and shake pattern. Each of the two units

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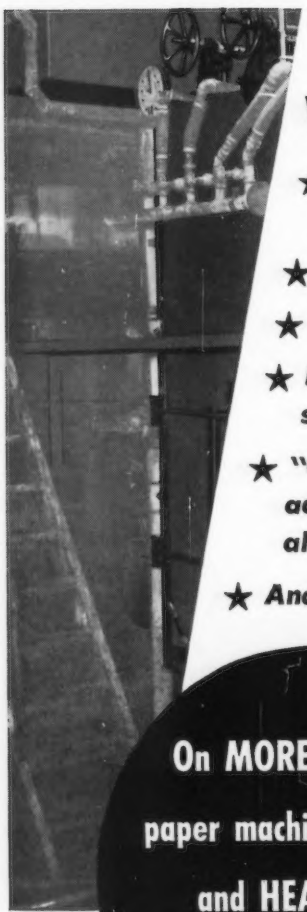

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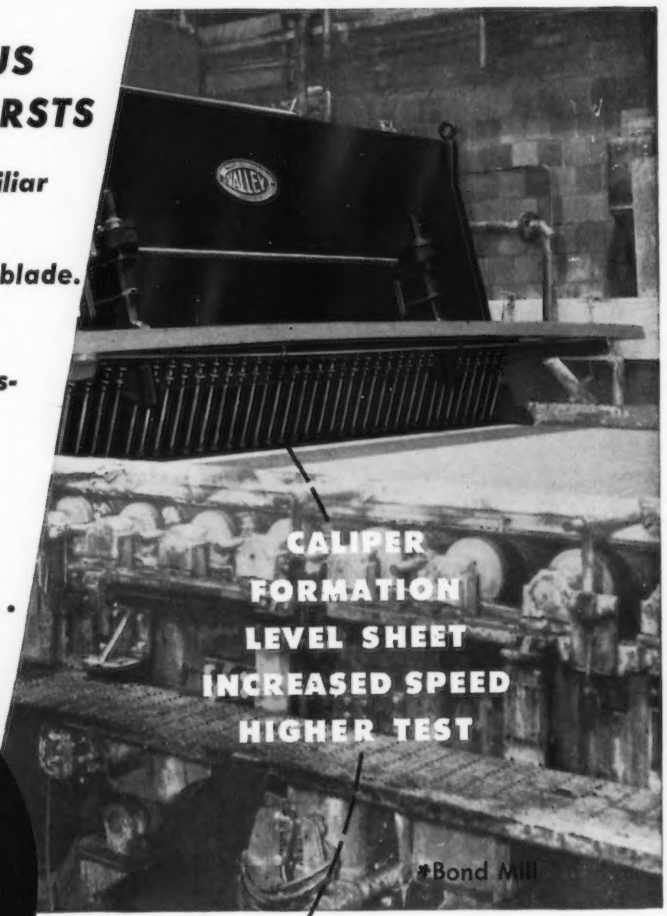

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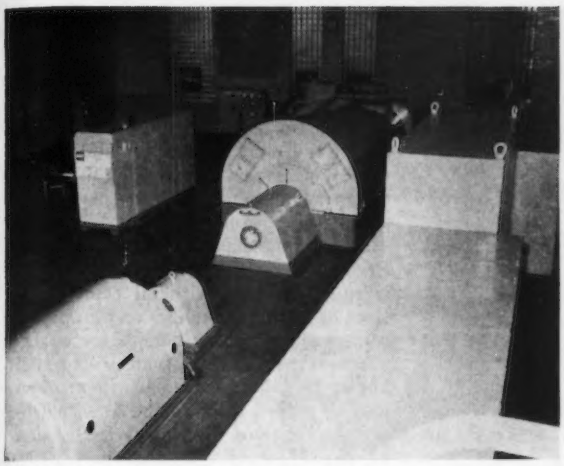
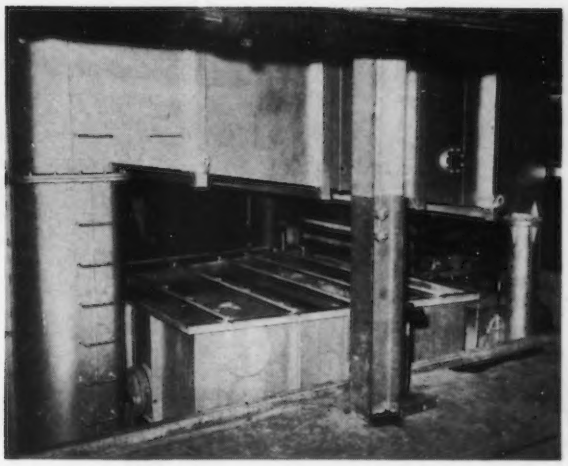


New Turbine Room—General View



Savola Save-All under #6 Machine.

is individually adjustable for lengths of shake stroke.

Stainless steel, rubber and other non-corrosive materials are used widely at the wet end of the machine to protect against corrosion. Rubber covered aluminum table rolls and Beloit suction boxes of stainless steel construction are used on the Fourdrinier.

Both the Beloit suction couch roll and the Beloit suction press roll are of modern design, with air loaded packing strips to provide maximum suction area efficiency because of even contact along the length of the shell. In addition to the suction first press, there are two plain presses and a plain reverse press. All presses are equipped with diaphragm type air loading so that operators can control separate front and back loading from panels conveniently located on the front press frames. Oscillating doctors are used on presses. Press felts are provided with motor driven felt stretchers and with Vickery felt conditioners.

The dryer section is equipped with Beloit duplex steam fits and syphons, and there are flexible blade type dryer doctors where necessary to insure trouble-free operation.

Electric motor lift is provided for the calender stack. The reel is a three-drum revolving unit equipped with a special device to maintain constant tension. A continuous oiling system, complete with tanks, filter equipment, motor driven pumps and sight feed regulators, supplies oil to the dryer bearings and calender stack bearings.

Potential machine speeds of 750 f.p.m. or higher are possible from the mechanical drive system, using Beloit hypoid gear units driven by belts running from the lineshaft. Controls for the motor driven belt shifters and for the multiple disc type mechanical clutches are conveniently located at the front side of the machine.

It has been seldom in recent years that a modernization program has embodied so many phases as are visible in the Rhinelander expansion, including as it does a new pulping process, by-product and extensive stream improvement facilities, complete power change-over, and notable expansion in both pulp preparation and machine tonnage, not to mention additional finishing and warehouse services.

Develop New Centri-Cleaners For Pulp and Paper Field

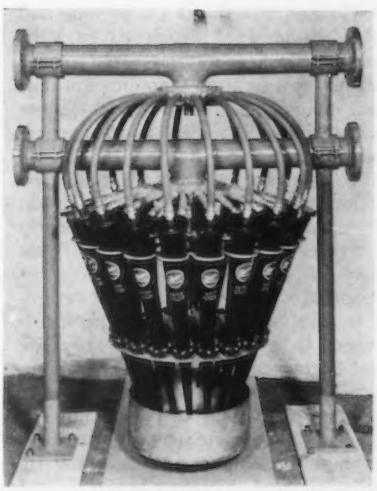
Bauer Bros. Co., Springfield, Ohio, have developed a new line of Centri • Cleaners especially for the pulp and paper industry to make possible new high standards of paper cleanliness. Continuous effective rejection of bark specks, dirt solids, abrasive particles, fiber aggregates, shive, alien solids, etc., is accomplished to varying degrees by various sizes of units, each designed to do a specific kind of separation.

Centri • Cleaners are patented devices for removing dirt from fibrous pulps of low consistency. They incorporate design features embodied in U. S. Patent No. 2,377,524 and Canadian Patent No. 429,584. Other patents are pending.

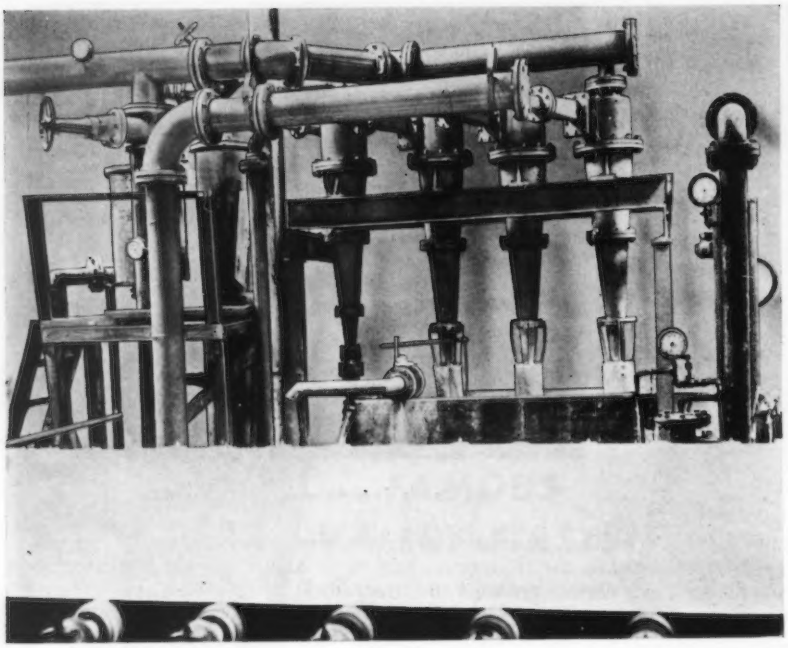
Centri • Cleaners provide a mean of making substantial savings in pulp preparation through the use of dirty, rough, or unbarked woods. Wood, wood-room, and screen room expenses can be reduced.

The commercial development of Centri • Cleaners is the result of a three-way cooperative effort on the part of The Hammermill Paper Co., Erie, Pa.; The Howard Smith Paper Mills, Ltd., Cornwall, Ont.; and The Bauer Bros Co.

The development of The Hammermill type (Bauer No. 600 Series) Centri • Cleaners was aimed at the removal of fine light dirt from pulps. This dirt was not removable by riffling, screening, or conventional types of centrifugal separators. The research program started in 1941, resulted in the commercial use of the small Cen-



Battery of No. 601—3x1½x⅝ (Hammermill Type) Centri-Cleaners.



Installation of No. 622—12x3x3 Centri-Cleaners ahead of a Paper Machine.

tri • Cleaners in the Erie plant for the removal of light impurities, such as small bark fragments, pitch, wood dirt, etc., from their high grade bond papers.

The No. 622, or Howard Smith type Centri • Cleaners are generally suitable for high volume treatment of paper or board fibers in the pulp mills, or ahead of the paper machines. The original installations made by the Howard Smith Paper Mills were in their soda pulp mill where conventional cleaning methods were inadequate to provide the degree of cleanliness needed. Later installations were made in their sulfite and kraft plants.

The patents (now assigned to The Bauer Bros. Co.) originally allowed to the Hammermill Paper Co. predate and cover the Howard Smith Paper Mills designs. Consequently, a program for further research and application has been mutually established by the three cooperative companies and improvement patents are pending.

From a series of well controlled laboratory tests there has been established physical evidence that closely confirms the mathematical laws that apply to the operation of Centri • Cleaners. Centri • Cleaners are designed to take full advantage of the forces present in a Free Vortex. They are used on bleached and unbleached pulps and can be installed in many different locations in the pulp or paper mill. The usual optimum consistence of the pulp for best cleaning results and low installation and handling costs is 0.5 percent, although consistency can be varied in a range of 0.2 to 1.0 percent. Capacity of individual Centri • Cleaners is ½ ton to 60 tons per day.

Generally speaking, the No. 622, 12 x 4 x 4 Centri • Cleaners find their best applications in the pulp plants, usually following the knotters, because the larger size units tend to reject larger pieces of bark and other dirt along with fiber aggregates or shive. No. 622, 12 x 2 x 2, and No. 600 Series, 3 x ½ x ⅝ Centri • Cleaners are best suited for the rejection of extremely fine dirt specks.

While there are no adequate standards for generally expressing cleanliness, it is estimated that about 90 percent of the visible dirt can be removed by well engineered Centri • Cleaner installations.

The power requirements (for pumping stock) for the operation of Centri • Cleaner installations is about 1 hp. day per ton. Cone inlet pressure is in range of 40 to 50 p.s.i. in normal applications.

Centri • Cleaner installations require a minimum of usable mill space, and can be varied in design details to suit local conditions. About 1 square foot of floor space per daily ton of pulp is required for No. 600 Centri • Cleaners, and less on the No. 622 units. Complete installation drawings are available. Centri • Cleaners are supplied as individual units, or can be furnished assembled with all header piping and structural members.

No. 622 Series Centri • Cleaners are constructed of interchangeable cast iron sections, having interior surfaces completely protected against erosion and corrosion by a precision molded lining of vinyl plastic. Exteriors are coated with plastic type protective sprayed coating. No. 600 Series Centri • Cleaners are molded in interchangeable parts of a shock resistant hard rubber compound. Rustless bolts are used to assemble the sections and mount the units to headers and structural members, which are usually plastic sprayed or dipped for protection against corrosion.

A separate department of the Fiber Products Laboratory, Springfield, Ohio, is fully equipped with all commercial sizes of Centri • Cleaners and auxiliary equipment needed to completely evaluate cleaning and classifying tests of all kinds of pulps. Canadian clients can also be served through the fine laboratory facilities of the Research Division of the Howard Smith Paper Mills, Ltd., at Cornwall, Ont. Qualified professional engineers supervise both operations.

New Wet-Bottom Electrostatic Precipitators

Initial operation of their first new wet-bottom type electrostatic precipitators has been reported by Mead Corporation and Riegel Paper Corp. The wet-bottom design is a new development in precipitators for paper mill applications. Utilizing a circulating black liquor flow, instead of dry dust hoppers and conveyors, a wet-bottom system enables rapid re-use of the collected dust. The new precipitator, (patents pending) was developed by Research Corp., Bound Brook, N. J., initiator of many "first" Cottrell precipitator applications in a wide range of industrial activities.

The new wet-bottom precipitator at the Mead Corp., Chillicothe, Ohio plant removes sodium carbonate from gases leaving a spray-type recovery furnace used in processing black liquor in soda pulp making. The furnace was designed to process approximately 525,000 lbs. of black liquor solids daily. At rated capacity the precipitator will clean 61,250 cu. ft. of gas at about 300 F with 95 percent rated efficiency. Under present mill operating conditions, 350,000 lbs of black liquor solids are being processed daily with a gas volume through the precipitator of about 44,000 cfm at 270 F. Under these conditions, an efficiency in excess of 97 percent is being realized.

At the Riegel Paper Corp. plant, in Acme, the new precipitator removes sodium sulphate from gases coming from a spray-type recovery furnace handling 750,000 lbs. of black liquor solids per day. On installation, the precipitator was designed to clean 112,000 cfm of gas at 280°F at a rated efficiency of 90 percent, but operation reports show that actual recovery efficiency is 95 percent.

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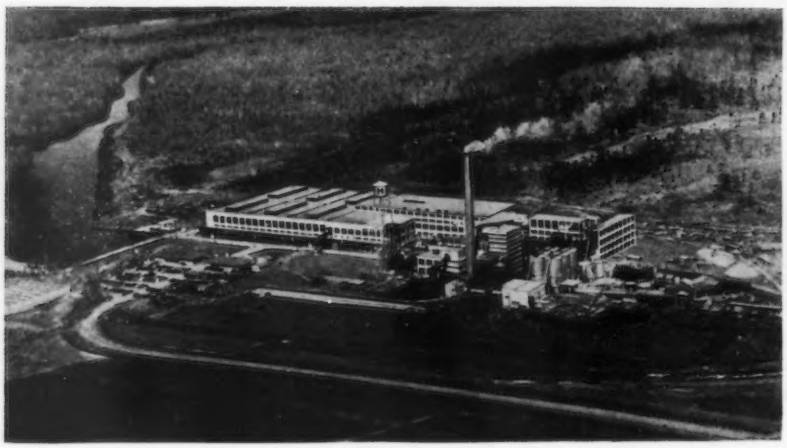


Hudson's Palatka Mill

In the major expansion program which the Hudson Pulp & Paper Corp. recently carried out at its Southern Division, Palatka, Fla., at a cost of approximately $10 million, all of the work was done on individual contracts, executed under the supervision of the company's construction and engineering department, which acted as its own general contractor. A. M. Lund, vice-president in charge of engineering and equipment, with the assistance of Rae H. Mills, plant engineer, and his staff, supervised the project from the digging of foundations to the installation of the last piece of equipment. Although the work was done during a period of spiraling prices, the company believes that it saved a substantial amount of money by acting as its own contractor. J. E. Sirrine & Co. of Greenville, S. C., the designing engineers, also assisted in the supervision of construction.

The new mill has a rated capacity of 400 tons of kraft paper a day. This is converted into grocer's bags and sacks, garment bags, kraft wrapping, butcher's paper, multiwall sacks and gummed sealing tape of which the company is the world's largest producer, selling its products under the brand names of Orange Core and Blue Ribbon.

The Palatka plant is served by the Seaboard Air Line R.R. an intense developer of the South as a paper making center.

Hudson owns 300,000 acres of woodlands in the vicinity of the mill, which permits complete vertical integration of all of its operations thereby assuring uniform quality and control of all of its production.

The company also owns mills in Augusta, Me. and Bellows Falls, Vt. The Augusta mill manufacturers all of the company's household paper napkins, of which it is the world's largest producers, while the Bellows Falls mill manufacturers Orange Core and Blue Ribbon gummed sealing tape.

Each phase of the work was submitted for bids separately by the Hudson Engineering Department, which thus saved the overhead that a general contractor would have added. Contract for building construction was awarded

Figure 2—Pulpwood Truck Delivery.

to Hillyer & Lovan, Inc., Jacksonville, Fla., steel tanks were bought from the Ingalls Iron Works of Birmingham, Ala., on a delivered and erected basis, boilers were bought from the Babcock & Wilcox Co. on a similar basis, and the precipitator for the recovery plant was fabricated and erected by the Koppers Co., Pittsburgh. The Blaw-Knox Co., Pittsburgh, had the contract for piping installation, machinery erection and electrical work and sub-let machinery erection to the Eichley Corp., Pittsburgh, and the electrical work to the Patterson, Emerson & Comstock Co., Birmingham, Ala. A separate contract for the sprinkler system was let to the Moore Pipe & Sprinkler Co., Jacksonville, Fla.

This was the first major expansion undertaken by the Hudson corporation at Palatka since the original plant, which started operations in November, 1947, was built at a cost of $8 million. Its rated capacity was 150 tons a day, which has increased to 400 tons a day. In the design of the plant additions provision was made for a bleach plant, which may be built at a later date. There is ample room for any further expansion that might be decided upon as the fenced-in plant area embraces about 60 acres.

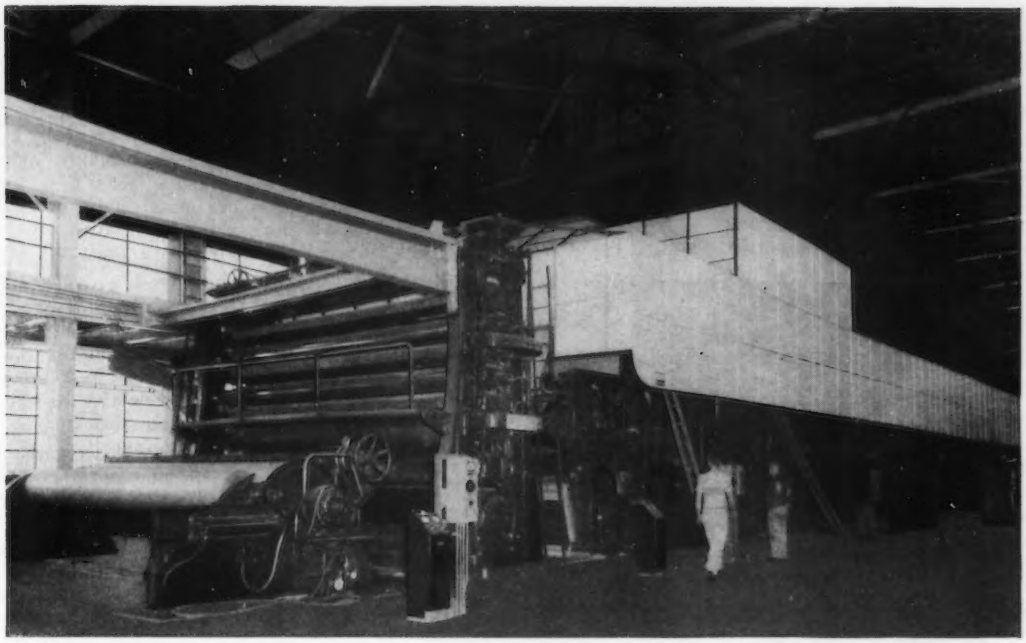
Although the expansion program involved every phase of facilities from the wood yard to the storage and shipping warehouse, there was no serious disturbance of regular production in the older part of the mill.

Starting with the wood yard, the area was doubled to 200,000 sq. ft. and a P.& H. 855 crawler crane and a Lima 804 crawler crane were added, built by the Stephens-Adamson Co., Aurora, Ill., which made the original installation. Other additions to equipment there were a barking drum, 12-ft. dia. by 45 ft. long, furnished by Fibre Making Processes, Inc., Chicago; an 88-in. chipper with 10 knives built by the Carthage Machine Co., Carthage, N. Y., and two Rotex chip screens, 5 by 14 ft. each, made by the Orville Simpson Co., Cincinnati, Ohio. A wood room addition, two-story brick and concrete, 1750 sq. ft., increased the total area of this section to 4000 sq. ft. A one-story outside locker room of 1000 sq. ft. was also built to provide for the wood yard crew.

Pulp Mill

Being one of the few pulp mills in the United States which uses the indirect cooking system, the Palatka mill expanded its previous installation of four digesters by the addition of five more of 10-ton capacity each, the same as the ones originally installed. These are equipped with 8-in. Paul automatic blow valves as are the original diges-

Eichleay Installed 4,000 Tons of Equipment



in the HUDSON PULP & Paper Corp. Mill at Palatka, Fla.

Whether the project involves the handling of a single unit or the entire plant equipment Eichleay service is prompt, economical and dependable.

The Paper Machine, shown above, weighing approximately 1400 tons was one of the items of equipment installed by Eichleay at the mill of the Hudson Pulp and Paper Corporation, Palatka, Florida.

Other installations included Lime Kiln, Conveyor Systems, Pumps, Chippers, Barking Drums, Digesters, Washers, Jordans, Evaporators, etc., totaling more than 4000 tons. Difficult conditions were encountered in many instances, but all installations were accomplished with minimum interruption of routine mill operation.

Eichleay also installed 3400 Tons of Machinery in the new Pulp Mill of the Riegel Carolina Corporation at Acme, N. C.

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ters and the indirect cooking system built by Fibre Making Processes, Inc. Mason-Neilan automatic cooking controls are used.

A doubling of capacity of the heat recovery plant and the turpentine recovery system was also carried out, with addition in both cases of equipment built by Fibre Making Processes, Inc.

The brown stock washing system was enlarged by the addition of an Improved Paper Machinery Co.'s three-stage washer, 8 ft. dia. by 12 ft. long. Ahead of the washers an Impco deknotter and a Permanent magnet, the latter furnished by the Eriez Mfg. Co. of Erie, Pa., were installed.

In the screening process there was an addition of three new screens made by the Trimbey Machine Works, Glens Falls, N. Y. However, there was switch of screens to eliminate bottlenecks that had sometimes occurred on the No. 1 paper machine. One Trimbey was taken off the old machine, being replaced by an Impco No. 4 screen. The Trimbey was added to the new machine, making three of that make used there. An Impco 8 by 12 ft. decker, was removed from the old machine to the new machine and an 8 by 14 ft. Impco decker was installed on the old machine. This has given greater screening capacity to the old machine and amply providing screening for the new machine. Also in the screen room Hudson installed a screen reject refiner, made by the Bauer Brothers Co., Springfield, Ohio, to serve the new paper machine and an Impco 14 flat plate screen for rejects from both machines.

Figure 3—Pulpwood inspection.

Refining System

In the refining room there have been installed two Noble & Wood three-roll continuous Victory beaters and four Noble & Wood Unifiners and a white water save-all, 8 by 16 ft., made by Olived United Filters, Inc. Chests for batch coloring of stock were furnished by Stebbins Engineering & Mfg. Co., Watertown, N. Y., which furnished all chests used in the plant, while Noble & Wood agitators are used for all chest agitation. Consistency regulators for washer stock, screen stock and broke are the product of the Trimbey Machine Works. For feeding broke back into the system, a Pulpmaster, made by the E. D. Jones & Sons Co., Pittsfield, Mass., was also included in the refining room equipment.

The new paper machine, built by the Pusey & Jones Corp., Wilmington, Del., is a 234-in. special fourdrinier M. F. and M. G. kraft type, with a maximum trim of 214 in. for weights of 18 to 35 lbs. It is equipped with a 12-ft Yankee dryer and includes as its special features a pressure inlet, pick-up attachment and clever leaf press section.

The pressure inlet is the latest patented Beloit design for operating speeds up to 2000 ft. per min. It is of the cross-flow type with quick removable elbows at front and back connections and clean-out openings for washing purposes. The two chambers of the cross-flow distributor are the tapered type to accommodate reduction of flow across the machine, with end openings for recirculation of stock.

There are five Neoprene covered rectifier rolls of the headless type with removable stainless steel journals and water lubricated bearings. They are motor driven and equipped with gear reducers on all five rolls. The distributor rectifier roll is mounted in the throat of the distributor; two rectifier rolls are mounted vertically at the center of the main headbox, and two rolls are mounted adjacent to the main slice, these last in adjustable bearings to permit positioning of rolls with respect to the apron board and main slice.

The headbox is provided with a special seal between the cover and main slice member to permit maintenance of pressure or vacuum in the headbox and to control the level of stock and water independently of the pressure condition at the slice lip.

The fourdrinier section is built for wire 125 ft. long and 234 in. wide. The breast roll is 34 in. dia. and 238 in. wide. Next to it are the forming boards, which have Micarta blades angularly fitted to prevent sag and disturbance of sheet formation. Eight narrow forming boards with Micarta tops 4 in. wide are placed in locations to suit operating conditions.

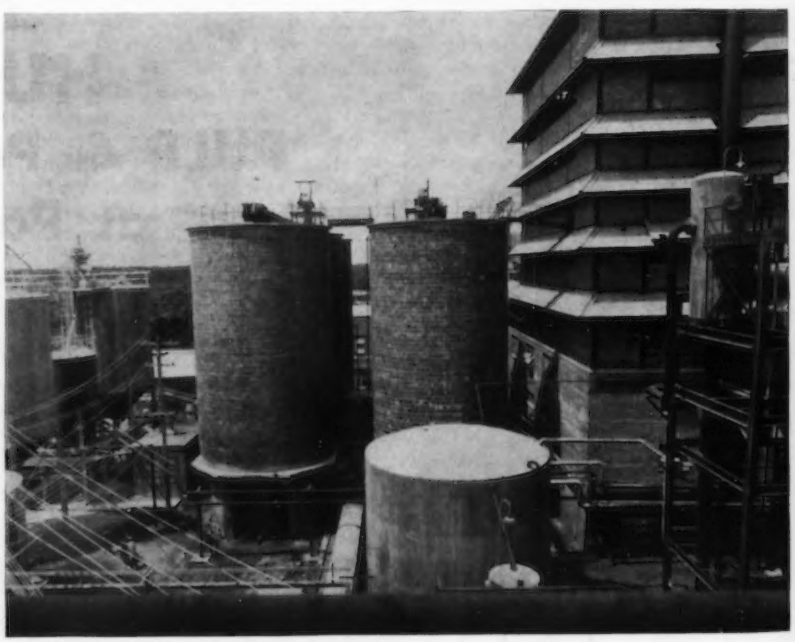


Figure 4—New chip storage silos.

Four fin type table rolls of the latest Sinclair design are installed. Other table rolls are covered on face and ends with a special grade of hard rubber. There are fourteen curved splash plates with Micarta blades.

The guide, stretch and other return wire rolls are also of seamless steel tubing, with Monel metal jacket and Monel end head covers. The wire guide is a Nash automatic geared, high-speed mechanism. To regulate tension on the wire, one of the rolls is equipped with swinging arms from the sill plates and connected to a pneumatic loading system with air regulating and relief valves to apply and record desired loading pressure. Two of the return rolls are provided with manually-operated gearing and a vertical screw device to raise and lower rolls to desired positions. A doctor of rigid stainless steel frame has a Lodding floating type Micarta blade and holder at the breast roll and at each outside return wireroll.

The primary suction couch roll, 42 in. dia. by 236 in. wide, is of double-box Beloit design, fitted with an internal double compartment suction box, of high and low vacuum areas, for handling the entrained air and water at high speed. It also has a vacuum gauge and internal shower pipe and air device for blowing the paper leader on the first press felt when operating without pick-up felt. And it has built-in suction connections to headers under the machine room floor, thereby eliminating the use of removable hose connections and fittings.

Figure 5—Enlarged Evaporator Building Housing Swenson Equipment.

Six suction boxes have suction outlets which eliminate the use of conventional hose connections for connection to air and water separating unit for control of suction box vacuums. The first two boxes also have suction outlet on the front side for more efficient vacuum if desired.

The fourdrinier arrangement is of the high-speed shaking design with the latest Pusey & Jones "Rapi-drape" wire handling device arranged for installing wire from the tending aisle without removing the fourdrinier from normal operating position or detaching connections to brace stands, shake, suction boxes and showers. The wire table is of flat deck construction without provision for pitch adjustment.

Side frames for the welded steel box section are covered by a protective casing of stainless steel and connected with tubular cross beams to support the shake rails, table rolls, forming boards, deflectors, dandy roll, suction boxes, inside return wire rolls and save-all arrangement, all resting on three roller bearings equipped with under-carriages, each connected with a motor-operated hydraulic device which permits the mechanical rolling in and out of the under-carriages on tracks when new wires are being installed. The tracks cross the pit under the fourdrinier. Each under-carriage is fitted with a hinged track support to facilitate handling of new wires.

The shake mechanism, consisting of two high-speed units, is arranged along the back of the fourdrinier section, each having an enclosed adjustable stroke device which gives a horizontal motion of from 0 to 1 in. amplitude. A Tex-rope drive connects the shaft with a variable speed motor of 85 to 500 shakes per min. The length and speed of the stroke is adjustable when running. One shake unit transmits motion to the breast roll and the adjacent end of the short section of the short shake rail and the other transmits motion to the opposite end of the short shake rail and the adjacent end of the long shake rail, thus providing quick adjustment of shake motion at either or both points to suit operating conditions. There are Bakelite connections between the shake rails and shake units. The hydraulic pump units are Vickers.

The main press part is a Beloit "Dual" or clover leaf arrangement, designed for use of two press felts, each about 55 ft. long. Two suction press rolls, also of Beloit design, are 36 in. dia. and 236 in. face, with a 1 in. rubber cover, and have an air-operated diaphragm for applying and regulating nip pressure. The center roll of the "dual" press is 60 in. dia. Stonite covered.

Between the last main press and the first lower dryer is the smoothing-creping press, which consists of an upper press roll and a lower drying cylinder for removing wire and felt marks.

The dryer section consists of three sections, with an intermediate smoothing press between the first and second sections and an M.G. dryer between the second and third sections. There are 33 main dryers, each 60 in. dia., and 14 felt dryers each 60 in. dia. All have a face of 232 in. for 125 lb. working steam pressure. The dryer driving train is a high-speed enclosed arrange-

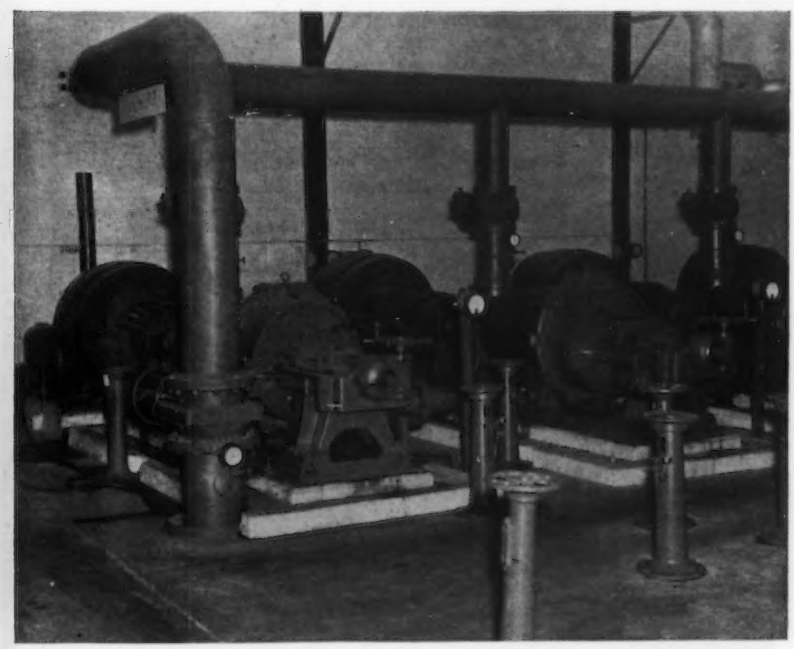


Figure 6—New Noble & Wood unifiners installed in conjunction with two Victory Beaters.

ment with a spur gear, mounted next to the neck and on the back journal extension of each dryer. All of the dryers in the lower tier of each section are horizontally connected by intermediate idler gears. The felt dryers are not geared. The Bowser circulating system is used for lubrication.

The intermediate smoothing press, situated between the first and second dryer sections, consists of two rolls for controlling denseness and caliper of sheet may also be used for striped or ribbed marking in sheet by means of a grooved roll.

The M. G. Yankee dryer attachment for machine glazed paper is situated between the second and third dryer. It is 12 ft. dia. by 228 in. face over heads and 222 in. full drying face.

Reeling equipment consists of a Pope-type uniform speed reel with four reeling drums. There is a high-speed winder for rolls up to 60 in., dia. and 214 in. maximum trimmed width. The slitting attachment is directly ahead of the winding drums for convenience and to eliminate long draws. This consists of ten pair of shear cut slitters. The hydraulic de-elevator was built by the Link-Belt Co.

The machine is equipped with a General Electric sectional drive. The section drives are of the d.c., adjustable voltage type. Each section of the machine is driven by a separate motor through a gear reduction unit. Each section motor is supplied by a separate generator, with the exception that where there is more than one motor operating on a common felt, one generator will supply all the motors in that group. When several sections regulated and all other motors will operate as helpers.

The motor speeds are adjustable so as to give the desired operating speed range by generator voltage control. To allow for draw, the various sections are arranged to operate at slightly different speeds. The relative speeds are held constant by a separate speed regulator for each section. To accomplish this, individual sections are equipped with a tachometer generator, the output voltage of which provides a direct means for measuring the section speed. This voltage is referred to a reference voltage which supplies a base, since it is held constant by an electronic voltage regulator. The two voltages are compared in a separate electronic amplifier for each section and, if a difference exists, the amplifier immediately adjusts the particular generator field to change the motor voltage and correct the speed. Since the response time of the system is very fast, this arrangement is highly responsive to even the most sudden load changes. It also lends itself to flexibility of control in that a very small rheostat can be used to provide draw adjustment for the various sections. The use of mechanical pulleys or other complicated mechanical arrangements is eliminated.

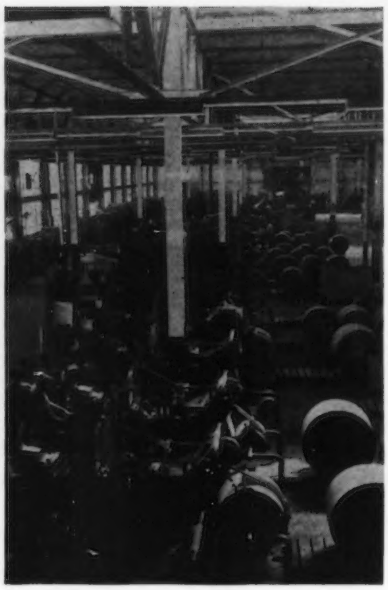


Figure 8—Part of the Grocery bag department.

With this type of drive, any section may be started, stopped or jogged at slow speed independently of any of the other sections. The overall drive may be operated at any desired speed within the operating range, stopped, and when restarted will automatically accelerate at a controlled rate to the previous speed. Deceleration in each section is controlled by regenerative braking.

The multiple generator arrangement is a very important characteristic of this drive and affords several advantages in design and operation over a single generator drive sometimes used. The rise of the multiple generator system obviates the necessity of de-rating the d.c. drive motors because they all operate with a fixed field strength, regulation being obtained through the generator field, and thus through the motor armature voltage. Since the motors are operated at full field at different speeds, they have full torque efficiency at those speeds, a condition not found when motor field control is used. A faster response to control signals characterizes motors operated with full field; in a motor field control system, slower responses are obtained under weakened field conditions.

Recovery & Steam Plant

Six new evaporators were added. They are body sextuble effect L.T.V. type, made by Swenson Evaporator Co. and designed to concentrate 223,500 lbs. per hr. of weak black liquor containing 14 percent solids, and at a temperature of 180 deg. Fahr. to 56,800 lbs. of strong black liquor at 55 percent solids.

Causticizing equipment, which was installed in the original plant by the Dorr Co., has been supplemented by a white liquor clarifier, a green liquid clarifier and a dregs washer, all provided by the same company, a new lime kiln, 7 ft. dia. by 225 ft. long, built by the Traylor Engineering Co.,

Figure 7—Wet of the New Pusey & Jones.

Allentown, Pa., has also been added to the plant's equipment. It is equipped with an Oliver United mud filter.

In the recovery plant there has been an addition of a 250-ton Babcock & Wilcox furnace for recovery of chemicals.

Additions to the power plants included one 60,000 lb. per hr. oil-burning boiler and one 60,000 lb. combination oil and bark burning boiler, Babcock & Wilcox Co. equipment except that the oil-bark burner is equipped with an Abco furnace, made by the Abco Furnace Co., Fort Worth, Tex. In the turbine room a new 7500 kw. General Electric turbo-generator has been installed. It is of the double extraction and full condensing type, which extracts steam at 50 lb. and 150 lb., as may be required for process use, or it can condense steam for whatever electric load is needed, as for example low-process consumption. This, with the electric equipment previously in use, produces whatever additional electrical power may be needed. Westinghouse Electric Corp. furnished switch gears for the turbine room, unit substations and control equipment for the other departments. Motors are Westinghouse and Reliance.

A variety of new pumps has been purchased for various operations. The vacuum pumps on the new paper machine are made by the Nash Engineering Co., Norwalk, Conn., while in other services there are Ingersoll-Rand, Worthington, Byron-Jackson, De Laval and Labour pumps.

New Building

Housing of all of this new equipment required a good many new buildings and extensions of old buildings. Among these are: An addition to the salt cake storage building, giving a total of 20,000 cu. ft.; the mud filter building was increased in size from 450 to 750 sq. ft.; the lime kiln firing house, a one-story structure, was increased in size by 500 sq. ft. to 1000 sq. ft.; the causticizing area was increased by the addition of 320 sq. ft. to the lime slaker building, giving it a total of 1100 sq. ft., one story; three additional wood chip silos, with 3800 cu. ft. capacity each, were built; an addition to the recovery building is 50 by 75 ft. with a seven-tory level; the power house addition comprises 12,000 sq. ft., making the present power plant 25,000 sq. ft.

To provide for the five new digesters, an addition of 2800 sq. ft. was built. All nine digesters are now housed in a structure of 5000 sq. ft. The operating floor of the digester building is 48 ft. above ground level.

A three-story addition to the screen room and washer room, with 4200 sq. ft. of floor space, houses all of the additional washing and screening equipment, the total floor space of the building now being 8000 sq. ft.

Figure 9—A few of the typical Palatka products.

The new refining room has 19,000 sq. ft. as against 6000 sq. ft. in the old building, while the paper machine room is a two-story building totaling 40,000 sq. ft., of which 17,000 sq. ft. is new construction. Alongside the paper machine building is a new electrical control and pump room, a one-story structure with 7000 sq. ft.

An addition to the converting plant had just been completed prior to the starting of work on the major expansion program. The new part is 48,000 sq. ft., giving a total of 96,000 sq. ft. on two floors. This building houses all multi-wall bag equipment, the grocery bag plant, the gum tape manufacturing department, laminating equipment and slitting, rewinding and sheeting equipment.

An entirely new feature is a water treatment plant designed for clarifying and pH correction of 12,000,000 gal. per day. The water treatment plant consists of a sedimentation basin, a chemical feed building and a one million gal. reservoir.

A new warehouse of 60,000 sq. ft. was built for storage and shipping. An old warehouse was utilized for enlargement of the converting plant, with an addition of 8200 sq. ft. to the converting floor space.

A new cafeteria seating about 200 persons was also a part of the construction program. It is a two-story structure with 4500 sq. ft. of floor space adjoining the paper machine building and converting plant. The second floor of the cafeteria building is used for core storage..

Another addition was a two-story building with 6600 sq. ft. of floor space, used for machine shop and storeroom. The storeroom is on the first floor and the maintenance shop on the second floor.

Operating Staff

The plant manager of the enlarged Palatka operation is J. L. Richardson, former general superintendent, who succeeded George A. Balko as manager some months ago.

Other plant supervisors and personnel are: W. L. Jones, Sr., general superintendent; L. J. Hebert, paper mill superintendent; R. H. Mills, plant engineer; E. A. Harper, pulp mill superintendent; J. S. George, converting superintendent; H. M. Shirley, wood procurement manager; J. R. Bush, plant controller; J. A. Berg, industrial relations director; D. L. Cameron, purchasing agent; C. W. Wright, superintendent power plant; C. H. Eastman, bag mill superintendent; J. H. Williamson, multiwall bag superintendent; A. L. Ezell, master mechanic; Roth Poe, chief electrician; J. B. Brett, safety engineer; O. M. Johnson, paper mill assistant superintendent; A. M. Barnett, paper mill assistant superintendent; C. S. Toliver, paper mill assistant superintendent; R. W. Ecker, pulp mill assistant superintendent; H. C. Mahan, pulp mill assistant superintendent; C. L. Moore, assistant pulp mill superintendent; M. M. Stewart, assistant master mechanic; W. F. Falls, assistant master mechanic; Fritz Paul, chief chemist; Ray Hatch, research director; Frank Gibson, chief accountant.

Equipment and Suppliers

Pawling & Harnishfeger Co.—crawler crane for wood yard.

Lima Locomotive Works, Inc. — crawler crane for wood yard.

Stephens-Adamson Co.—Extension of wood yard conveyors, sorting conveyor, chip handling and refuse conveyors.

Fibre Making Processes, Inc.— Barking drum, indirect cooking system, Mason-Neilan Co. automatic cooking controls and equipment for recovery plant and turpentine system; also 14 plate flat screen for rejects.

Carthage Machine Co.— Chipper.

Orville Simpson Co.— Two Rotex chip screens.

Chicago Bridge & Iron Co., Birmingham, Ala., branch. Five 10-ton digesters.

Improved Paper Machinery Corp.— Brown stock washing system and deknotters ahead of washer.

Eriez Mfg. Co., Erie, Pa.—Permanent magnet for removal of tramp metal.

Trimbey Machine Works — Three screens; several consistency regulators.

Bauer Brothers Co., Springfield, Ohio—Screen reject refiner.

Noble & Wood Co.— Two three-roll Victory beaters and four N & W unifiners; also all chest agitators.

Oliver United Filters, Inc.—White water save-all; also agitating equipment for batch coloring.

Stebbins Engineering & Mfg. Co.— All chests (structural tile).

E. D. Jones & Sons Co.— Pulpmaster.

Pusey & Jones Co.— 236-in. Fourdrinier paper machine.

Link-Belt Co.— De-elevator at end of paper machine.

Dorr Co.— Supplemental causticizing equipment.

Traylor Engineering Co.—New lime kiln equipped with Oliver United mud filter.

Babcock & Wilcox Co.— 250-ton recovery furnace, oil burning boiler, combination oil and bark burning boiler and bark burner equipped with Abco furnace.

Abco Furnace Co., Fort Worth, Tex.—Furnace for B & W bark burning boiler.

General Electric Co.—7500 kw. turbo-generator.

Westinghouse Electric Corp.—Switch gear, unit substation and control equipment and motors.

Reliance— Motors.

Nash Engineering Co., Norwalk, Conn.—Vacuum pumps on paper machine.

Ingersoll-Rand Co.—Pumps.

Worthington Pump & Machinery Corp.—Pumps.

Labour Co., Elkhart, Ind.—Pumps.

De Laval Steam Turbine Co., Trenton, N. J.—Pumps.

Byron-Jackson Pump Co., Bethlehem, Pa.—Pumps.

J. E. Sirrine & Co., Greenville, S. C.—Designing engineers.

Hillyer & Lovan Co., Jacksonville, Fla.—Structural work.

Blaw-Knox Co.—Piping, machinery erection.

Eichley Corp., Pittsburgh, Pa. — Machinery erection subcontract under Blaw-Knox Co.

Patterson, Emerson, Comstock Co., Birmingham, Ala.Electrical work subcontract under Blaw-Knox Co.

Ingalls Iron Works, Birmingham, Ala.—Steel tanks.

Koppers Co., Pittsburgh, Pa.—Precipitator for new recovery plant.

Moore Pipe & Sprinkler Co., Jacksonville, Fla.—Sprinkler system.

General Electric Co.— Turbo-generator and paper mill drive mechanism.

J. O. Ross Engineering Corp.— Paper machine hood and washer hood.

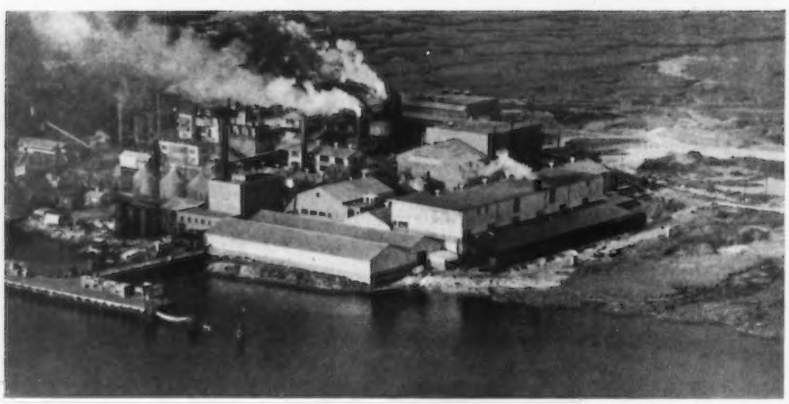
Swenson Engineering Co.— Evaporators.

Brooks-Fisher Insulating Co.— Tank insulation.

Fuller Co. (Catasauqua, Pa.) — Salt cake and lime installations.

W. D. Taulman & Son—Water treatment equipment.

Brunswick Pulp and Paper



Aerial View

Latest Expansion Program

General

In June 1950 the Brunswick Pulp & Paper Co. operating management presented to its principals a plan for increasing the daily capacity of its mill from approximately 290 tons per day to 400 tons per day. The mill was originally designed in 1937 for 150 daily tons, increased in 1940 to 200 daily tons, and later stretched to 245 tons per day. In 1948 a 45 ton expansion program was completed which brought the rated capacity of the mill to 290 daily tons.

As the mill, since its inception, has been a pioneer in the handling of bleached sulphate pulp from Southern pines and hardwood, quite naturally each stage of the modernization program brought about certain bottlenecks and inefficiencies.

The expansion program just completed was designed to produce pulp at 400 tons per day on an efficient and economical basis with first emphasis being on quality.

About the time the program was presented to Brunswick's principals for approval, the Korean War started. This posed many problems of a serious nature, but after due consideration the Board of Directors authorized procedure with the job in July 1950. Chas. T. Main, Inc. of Boston, Mass., was selected as consulting engineers for the job and in early August 1950, purchase of equipment and design work began. Since the outbreak of the Korean conflict, it was increasingly evident that materials to do the job would be difficult to secure. The consulting engineers has estimated that because of the necessity of tying in new equipment with existing equipment without shutting the mill down for the tie in, the program would entail a period of between fifteen and eighteen months before full production was reached. The Brunswick management, realizing the need for increased pulp because of the Korean conflict and defense needs, early in the program set August 1, 1951, a period of twelve months from the time of design work and purchases started, as the completion date for the job. Brunswick operating management realized that an unusual team composed of engineers, construction people and the operating management must be formed if the job was to be done in the required period of time. Special emphasis was placed on the fact that the mill could not be shut down for tying in new equipment and in addition, production must be maintained at then current rates, if not increased.

By December 1950, sufficient design work had been done by Chas T. Main, Inc. and sufficient equipment received in order to start construction work. However, for all practical purposes, no construction of any measure was

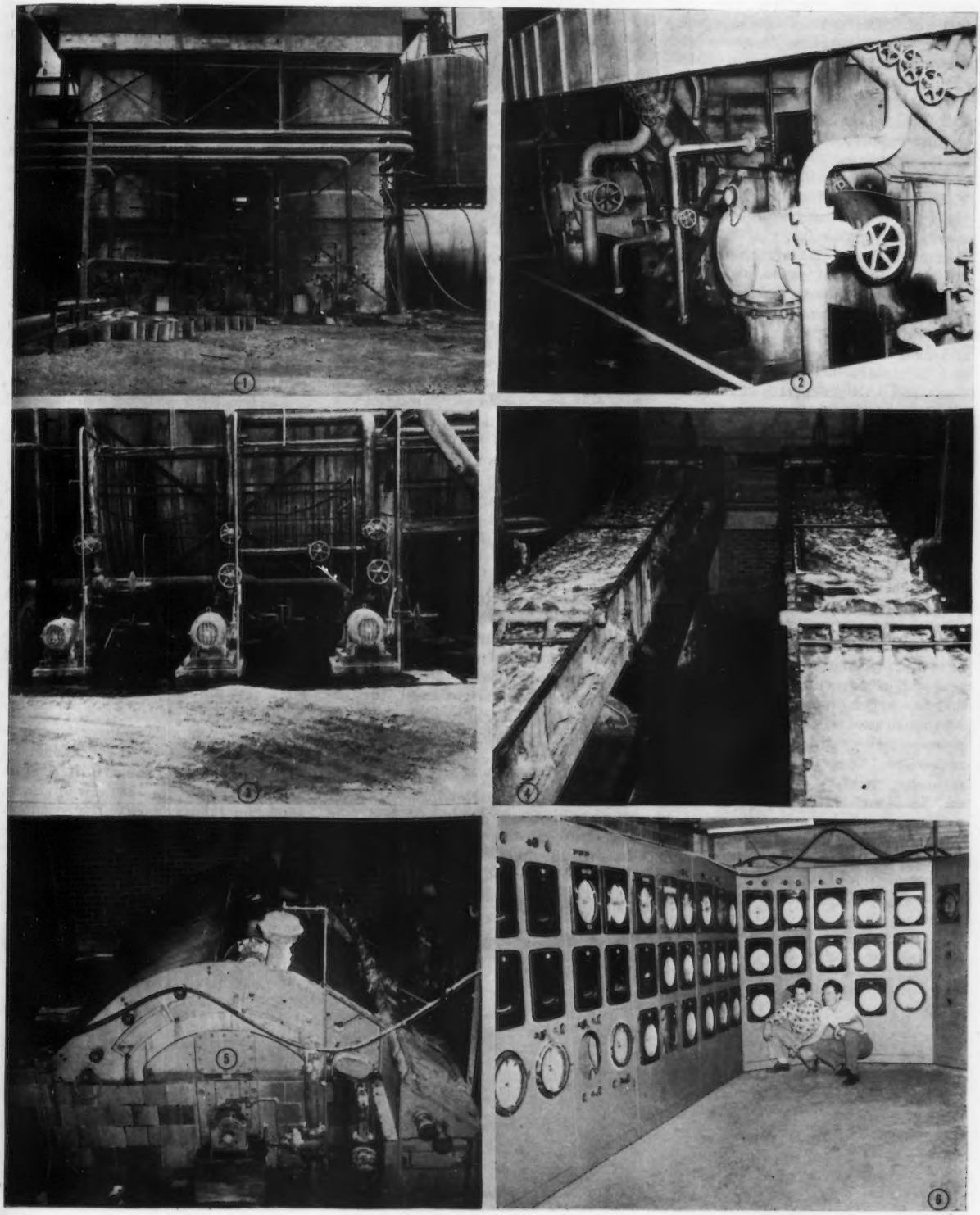


Figure 1—Brown Stock Hi-density Storage Chests. Designed by Stebbins Engineering and Mfg. Co. Agitating Equipment by Improved Paper Machinery. Figure 2—Oliver Black Liquor Washers, Wash Room. Figure 3—Warren Black Liquor Transfer Pumps, Wash Room. Figure 4—Improved Paper Machinery Flat Screens for Brown Stock. Figure 5—First Stage Chlorination Washer Bleach Plant by Improved Paper Machinery Co. Figure 6—Foxboro Control Panel for Bleach Plant.

started before January 1, 1951. Exactly seven months and one day later production at the 400 ton rate was achieved. The mill is now operating at the 400 ton rate and on many days shows production in the range of 425-450 daily tons.

Tidewater Construction Co., Norfolk, Va., served as the contractor for the driving of all piling, erection of steel, construction of buildings and setting of equipment. Rowland Tompkins & Son, Inc. of New York was the piping contractor, and Rollinson Engineering Co., Savannah, Ga., served as electrical contractor on the job. These three principal contractors were served by many sub-contractors. However, all three were coordinated in the field by the Brunswick operating management and field engineers of Chas. T. Main, Inc. A remarkable degree of cooperation and work performance was achieved by all the three general contractors and at no time did conflicting interests arise where one general contractor was at loggerheads with another. During January, 1951, it was apparent that the job could not be completed by August 1, 1951, unless a detailed schedule of all work to be done was worked out so that each contractor would know specifically at what dates specific work was to be done and what type trade would be employed in so doing. The significance of this can be drawn from the fact that at the peak of construction the contractors had in excess of 500 trade employees in the Brunswick Pulp & Paper Co. plant working throughout the entire operations. At no time did these trades seriously interfere with the operation of the plant. In fact, average daily production of the mill was increased some fifteen to twenty tons per day during the construction period. After the completion of the detailed construction schedule, by trades, each general contractor was aware of the magnitude and scope of his job and the time to be allocated to each phase. Many laborious hours were spent in exploring ways

E. J. Gayner, III
President

and means whereby two jobs could proceed in the same area at the same time. The result of all these discussions was fruitful as will be noted by the completion of the construction schedule as outlined some eleven months previous. In spite of all this, the job still would have been virtually impossible had it not been for the complete understanding of the scope of the job and wholehearted acceptance by mill departmental operation heads. Their cooperation with contractors was outstanding.

The scope of the work originally was estimated at some $5,250,000 and is currently estimated to be slightly in excess of $6 million. Increased equipment cost and labor cost plus larger electrical and mechanical changes than originally envisioned caused the increased cost of the job. The scope for the work was as follows:

Wood Preparation

One new 80 D Northwest crawler crane with 80 ft. boom was added to the two existing Northwest cranes making a total of three for the handling of wood from cars to the yard or from the yard to the conveyor and into the mill. No change was made in the conveying equipment. The mill had previously operated its woodyard 96 hours per week in producing 290 tons of pulp daily. The 400 ton plant calls for operating the woodyard 112 hours per week, an increase in operating time of 11.6 as compared with approximately 40 percent increase in production. Production per woodyard hour operation has been increased by the installation of a new 10 knife Murray chipper to operate along side a 10 knife Carthage chipper previously installed in 1947. Only one chipper will be operated at a time, but as knife change time will not be a factor with two chippers and as the throat of the new Murray chipper is designed to prevent plugging, the increased production has been attained without great difficulty. Additional chip storage space was secured by simply raising the discharge conveyor over the existing chip bin about five feet, thus allowing the chips to be stored to a higher level in existing bins.

Electrically, wood preparation is fed through three 500 KVA Wagner single phase transformers 4160/480 volts. A modern filtered air ventilated control room houses all electrical controls, principally Westinghouse type "C" construction low voltage control centers. The two 10 knife chippers are driven by 400 HP, 4160 volt, 3 phase, 60 cycle, 450 RPM G.E. wound Roter motors, directly connected, through flexible coupling, to chippers. Permanet resistance is left in Roter circuit to give approximately 11 percent slip.

Digesters

Four new M. W. Kellogg Co. digesters were added to the existing six. The original digesters are of 3800 cu. ft. capacity as are the new digesters. However, the capacity has been cut approximately 10 percent by the installation of carbon linings by Stebbins Engineering and Mfg. Co. of Watertown, N. Y. The six old digesters, four of which had been in since the mill was installed in 1937, were showing signs of corrosion to the point where it was necessary to either line

G. K. Singletary
Plant Manager

J. W. McSwiney
Asst. Secretary-Treasurer

W. W. Krauss
Plant Engineer

these digesters or shortly give consideration to replacing them. It was decided to line the four new digesters in order to prevent any corrosion problem and also to allow leeway for any type of cook that might be desired. Each of the new four digesters have circulating systems of the Fibre Making Process type. Automatic digesters controls are installed on the four new digesters as had previously been installed on the old six. The automatic digester controls were furnished by Bristol. The automatic digester controls have given good service. Steam consumption has been reduced and the uniformity of the pulp produced has been increased. A new blow tank was installed after the four new digesters, and the digester repiped, so as to put five digesters into existing blow tank and five digesters into new blow tank.

Electrically, the digesters are fed through 1000 KVA unit substation and type "C" low voltage control centers located in filtered air control room.

Brown Stock Washers

The largest single phase of the expansion program was the construction of an entirely new wash room. The then existing wash room was entirely outmoded and offered no hopes of modernization to produce 400 tons of pulp.

The operating floor of the new wash room is located at the same level as the digester operating floor. Two lines of 8 x 12 Oliver black liquor washers were installed, three washers to each line, with a rewasher installed at the end of each line. The rewashers were taken from the old wash room and are of the Oliver type construction. Included as a part of the new wash building are two hi-density storage chests, one after each line of washers, 18 ft. dia. and approximately 45 ft. in height. These chests hold a storage of approximately three to four hours at the 400 ton rate. Liquor seal tanks are of the horizontal type, 18 ft. dia., the longest being 100 ft. and the shortest being approximately 70 ft. The new wash room has full instrumentation, flowrators measuring the flow of stock to each line of washers, and flow indicators controlling dilution on all washers, along wtih automatic level controls on all seal tanks. The rewashers deliver the washed stock to two hi-density storage chests from whence it can be drawn at desired rates by the screen room. Desired consistency is obtained by use of DeZurik Consistency Regulator. The mechanism for taking the stock out of the bottom of the hi-density storage chests was furnished by Improved Paper Machinery Co., and has worked very satisfactorily.

Electrically the wash room is fed through two 1000 KVA unit substations, type "C" construction low voltage control centers with filtered air control room. All washers are driven by G.E. variable speed D.C. drives. All stock moving units are electrically interlocked.

Screen Room

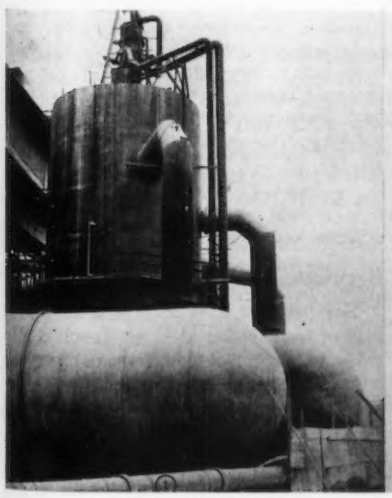
The original screen room contained six rows of flat screens of three sections each, and three rows of two sections each and two tailing screen rows of three sections each. Accepted stock was deckered over two 6 x 8 Oliver deckers and one 8 x 12 Improved Paper Machinery decker. In order to increase production to 400 daily tons five additional rows of flat screens of two sections each were installed, an additional section installed in each of the three existing two section lines, and one of the 6 x 8 Oliver deckers was replaced by an 8 x 14 Improved valveless decker. From the hi-density chest stock is drawn by means of a remote controlled valve at a pre-determined rate. The screen room operator controls the flow into a blending chest at about 3½ percent consistency. From the blending chest, stock is pumped into the section of a fan pump. The outlet of the fan pump is divided into two discharge lines, each entering opposite ends of a head box at the head of the screen room. The discharge into each end of the head box is controlled by remote control valves under the control of the screen room operator, and as the volume of the stock delivered to the fan pump is fixed from time to time, a variance in the opening of the control valves into the head box will either decrease or increase the consistency of the stock being delivered into the head box. Stock from the head box on to the flat screens is controlled by valves so that stock can be allocated over the screens as desired depending on the screening of individual screens at the time. Tailings from the two tailing screens pass over an IMPCO vibration screen and the reclaimed fibre is pumped back to the screen head box. This equipment minimizes the effect of surges on the tailing screen and resultant stock losses.

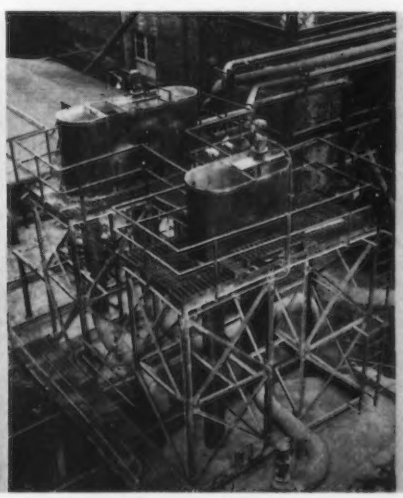
Accepted stock from the screen room is stored in three brown stock storage chests at 3½ percent consistency prior to delivery to the bleach plant.

Power for the screen room is fed through a 1000 KVA bank unit substation, type "C" low voltage control centers in modern filtered air control room.

Bleach Plant

Prior to completion of the 400 ton expansion program, Brunswick's bleach





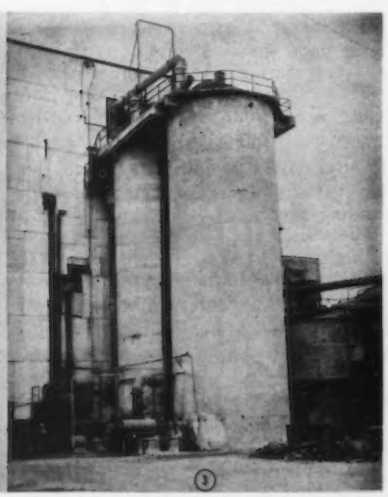


Figure 1—Black Liquor Seal Tanks for Wash Room. Hammond Iron Works. Figure 2—DeZurick Brown Stock Consistency Regulators. Figure 3—Chlorination Towers, Improved Agitating equipment. Constructed by Tidewater Construction Co.

plant had been operating since its inception in 1937 with the exception of the first and second stage washer, on 6′ x 8′ pulp bleaching washers. It was decided early in the program that all of these washers would have to be replaced and, with the exception of the first stage in the bleach plant, now all washers are 8′ x 16′. The bleach plant now consists of:

First stage—two 8′ x 12′ rubber covered Improved washers for the acid chlorination stage.

Second stage — 8′ x 16′ Improved washer discharging its stock into Kamyr hi-density hypo towers.

Third stage — one 8′ x 16′ Oliver washer from whence stock is dumped into two hi-density caustic towers of the Kamyr type.

Fourth stage — one 8′ x 16′ washer from whence stock is discharged to ten Fletcher bleachers.

Fifth stage—stock from the Fletcher Bleachers is thence put over an 8 x 16 final Oliver washer where it is discharged into an SO_2 soaking tower prior to delivery to the machine room.

Improved mixers are employed after the second, third and fourth stage washers to give good temperature and chemical mixing control. One 8 x 12 rubber covered Improved washer was retained along with the one 8 x 16 washer in the No. 2 stage. The new bleach plant will be controlled from a control room fully air-conditioned and at a level above all of the washers. The operator will be able to start and stop all equipment, control all vat levels from the control room without leaving it. He will also be able to observe the function of all washers without leaving the control room. This step was taken in order to prevent deterioration of the electrical equipment and meters and instruments by bringing in only conditioned air to the point of operation. It is also a means of providing good working conditions for the operators during the maximum period possible. It was recognized that the whole area could not be air conditioned, but a small localized area might be successfully handled. To date the plan gives promise of being an outstanding success.

The bleach plant power supply is fed through one 1500 KVA and two 1000 KVA unit substations, type "C" low voltage control centers in filtered air control room. All stock moving units are electrically interlocked.

Machine Room

Brunswick had in existence prior to the expansion program one Rice-Barton 156 in. Fourdrinier machine with sixty 5 ft. dryers and one 156 in. Kamyr wet machine and flakt dryer. The Fourdrinier was originally rated at 150 tons per day when the mill was built and during the 1950 expansion program it was raised to 200 tons per day. The Kamyr wet machine is rated at 175 tons per day by the manufacturer. It was believed by the operating management that these two machines could be stepped up sufficiently to average 400 tons of daily production. At this writing, it is evident that this can be done as peaks of 250 tons per day have been achieved on the Kamyr wet machine and rates up to 225-235 tons per day have been achieved on the Fourdrinier type machine. Admittedly, however, this is a tight point in the mill's operation.

A new 1000 KVA unit substation type "C" construction low voltage control center was installed to modernize the distribution to No. 1 machine. There was a comparable control room existing for No. 2 machine installed in 1947.

Left to Right, Back Row—A. R. Carrick, Asst. Superintendent in charge of Bleach and Machines; H. R. Wade, Asst. Superintendent in charge of Brown Stock; J. L. Brown, Asst. Superintendent in charge of Liquor Cycle; Front Row, M. B. Pineo, Technical Director; J. R. Girardeau, Woodyard Supervisor; N. H. Mailhos, Power Superintendent; W. J. Brown, Plant Superintendent.

Shipping Facilities

When the mill was built in 1937, it was necessary to take the pulp up an inclined ramp to get the pulp into box cars. This over the years proved to be a very costly item from a maintenance standpoint of trucks and equipment and also time consuming in loading cars.

A new loading shed was installed adjacent to No. 2 machine room and the road bed lowered to a point where pulp could be loaded from the same level as the warehouse storage shed. This was a particular problem at Brunswick because tides often cover an area as low as the track bed. This problem was overcome by diking around the tracks on the end with the lowest elevation and putting a flood gate in which would let drainage water out but would keep flood tides out. This has worked very satisfactorily and increased the efficiency of shipping facilities immeasurably.

Services

In order to produce this added pulp, additional electrical and steam generating capacity was required. A new 6250 KVA, 5000 KW, .8 power factor unit, 4160 volt, 3600 RPM, 400 psig initial pressure covering generator was installed with 150 and 35 lb. extraction with condenser capable of taking full generator capacity. This new turbine was installed and on the line in April 1951, just nine months after the decision to proceed with the job. A new 120,000 lb. B&W oil fired boiler designed for 450 psig, 725° t.t. operation with auxiliaries was installed. This allows steam in an efficient oil fired boiler, whereas previous operation had required that bark and oil be burned together. The old combination oil fired-bark burners are being remodeled with Hofft over fired air jets, redesigned grates and Thermix dust collectors installed ahead of the I. D. Fan to put them in efficient operating condition for bark burning only.

In order to provide a uniform sized bark for conveying and burning, an experimental Blo-Hog unit has been installed to hog all bark and refuse prior to conveying to the modernized bark burners. Consideration is being given to the installation of a screen ahead of the hog in order to reduce the material passing through the hog to only that size material actually requiring hogging.

Electrical Distribution

The primary Electrical Distribution system was changed over from 2300 volts to 4160 volts. General Electric metal enclosed switchgear was installed, all units being in line and fed from a 2000 ampere main bus. Each unit is equipped with air circuit breakers rated 1200 ampere and 250,000 KVA interrupting capacity. All outgoing feeders are equipped with Kilovav, Kilowatt, ampere and integrating

watt-hour meters. Each generator panel has Kilowatt; Kilovav; ampere and integrating watt-hour meters. Field volt and ampere meters along with necessary field application relays and control switches are also provided. Each machine has its own exciter and voltage regulator and a spare exciter along with its voltage regulator can be paralleled with and substituted for either of the three regular exciters.

The No. 1 Turbo-Generator-Turbine rating 4000 KW, double extracting partial condensing-generator rating 5000 KVA, .8 P.F., 2300 volts was rewound for 4160 volts. The No. 2 Turbo-Generator-Turbine rating 2000 KW, single extracting back pressure-generator rating 2500 KVA, .8 P.F., 2300 volts was also rewound for 4160 volts.

In addition the General Electric Turbo-Generator previously mentioned was installed.

All circuits of main distribution system terminate in departmental substations, 1000 KVA, 4160/480 volts, two at 1500 KVA, and type C low voltage control centers furnished by Westinghouse Electric Corp. The control rooms are well ventilated with filtered air to minimize the maintenance of controls to assure continuity of operations.

Motors installed are mostly General Electric totally-enclosed fan cooled and are started directly across the line. Motors 200 horsepower and smaller operate on 440 volts, 3 phase, 60 cycles, with a few single phase motors operating on 110 volts, 60 cycles. Motors above 200 horsepower operate on 4160 volts, 3 phase, 60 cycle power.

Liquor Cycle

Evaporators—Since the 1948 program, Brunswick had evaporator capacity slightly in excess of its requirements under normal black liquor washing facilities. However, as the black liquor washing facilities were inadequate, solids delivered to the evaporator ranged as low as 12 or 13 percent and as can be seen the evaporators were operating at capacity so far as water evaporation was concerned. By the installation of the new Oliver washers in the wash room, the solids delivered to the evaporators were increased to the point where additional evaporator capacity was not deemed necessary.

Recoveries—Prior to the expansion program, Brunswick had one 150 ton B&W recovery unit, one 75 ton B&W recovery unit, and one 220 ton Combustion Engineering recovery unit, the latter being installed in 1947.

During World War II, the No. 1 and 2 recovery units had been operating far in excess of capacity and were never fully repaired since that date. It was, therefore, deemed necessary to fully modernize the existing No. 1 Recovery unit and this was done by installing screen tubes over the furnace bed, the addition of an economizer, air heater, superheater tubes and a disc evaporator. A chemical ash tank was also installed to recover the ash, thus putting the unit in a completely modernized state. This resulted in a designed capacity for burning black liquor solids of 1,290,000 lbs. per day as compared with an estimated requirement at 400 daily tons of 1,200,000 lbs. per day.

The recoveries and evaporators are fed from two 1000 KVA unit substations, type "C" low voltage control centers located in filtered air control room.

Water Supply

In order to provide water requirements for the new addition, it was necessary to install a fifth deep well. This was put down by Layne-Atlantic Co. to a depth of approximately 1000 ft. and produces water at the rate of 3750 gpm. The overall water requirements for the Brunswick mill range somewhere between 65,000 and 70,000 gallons per daily ton.

A new pump house was constructed in which is located six pumps, three handling approximately 10,000 gpm of treated water and three handling approximately 9,000 gpm of untreated water. Electrical controls are housed in a section of the same building. A new distribution header system was also installed. This means that water is always available at the pumped rate and no one take off can completely run out of water. The new piping is entirely above ground eliminating much trouble from a maintenance standpoint. The water level at Brunswick is only two feet below ground and pipe corrodes rapidly when placed below ground in the salt water.

Equipment and Suppliers

Design & Engineering, Charles T. Main, Inc.
Construction, Tidewater Construction Co.
Crawler Crane, Northwest Engineering Co.
Chipper, D. J. Murray Co.
Digestors, M. W. Kellogg Co.
Carbon Linings, Stebbins Engineering Co.
Circulating System, Fibre Making Process Co.
Stock Washers, Oliver United Filters, Inc.
Consistency Regulators, DeZurik Shower Co.
Bleach Washers, Improved Paper Machinery Corp.
Water Well, Layne-Atlantic Co.

Timber Stand Reproduction Study Made

MARQUETTE, Mich.—Hardwood-hemlock stands will be followed by reproduction adequate in number of trees but less desirable in composition, according to a study of three stands made recently by the Lake States Forest Experimental Station in the Upper Peninsula.

F. R. Longwood, Marquette, research forester, and W. A. Salminen, forestry aide, issued a report on the study in which they pointed out that the three stands had an original volume of about 18 M board feet gross or 11 M board feet net per acre. One stand was clear-cut, about half the volume was cut in another, and the third was uncut.

Hemlock and yellow birch constituted over 60 percent of all stems five inches in diameter at breast height and larger in the original forest, but are minor species in the new stands. The trend in the reproduction is toward the increase of red maple and sugar maple at the expense of hemlock and birch.

Although yellow birch seeds in abundantly after cutting, it has been unable in these areas to compete with red and sugar maples in height growth. Deer browsing, of importance in some localities, has not been a limiting factor.

Red maple generally was the dominant species on the cut quadrats, but there was rather uniform distribution of reproduction of other species also.

Inland Container Buys Two Box Firms

Inland Container Corp. of Indianapolis has purchased Ashtabula Corrugated Box Co. of Ashtabula, Ohio, and its subsidiary, Erie Corrugated Box Co. of Erie, Pa.

Operations and management of the two box-making companies will remain unchanged for the present. The Ashtabula and Erie operations will continue to serve their own customers as well as Inland accounts located in their areas.

National Gypsum's

Aerial View

New $5 Million Mill at Pryor

Until January 25, 1952, three company owned paper mills supplied all of the paper for the ten gypsum board plants of National Gypsum Co. When the tenth wallboard plant was started up in July 1951 the production of the three paper mills located at Garwood, N. J., Kalamazoo, Mich. and Newburgh, N. Y., became insufficient to supply the requirements.

However, this shortage was soon remedied by the start-up of a new fourth paper mill at Pryor, Okla., on January 25, 1952. This mill has the distinction of being the first paper mill in the state of Oklahoma. The second mill (Coronado Mfg. Co.) which went into operation about six months later is described elsewhere in this issue.

The new mill is situated on a 49 acre site purchased from Grand River Dam Authority and located between Pryor and Chouteau, Okla.

The mill is housed in a single main building of steel and brick construction, 580 ft. long by 260 ft. wide, with 125,000 sq. ft. floor area.

An enclosed railroad siding connected with the Missouri, Kansas, Texas Railroad holds six cars along the loading platform. This platform and siding is on the north side of the building and runs parallel to the paper machine.

Utilities

All steam, electricity and water are purchased from Grand River Dam Authority. As a matter of fact, one of the reasons for building the mill at this location is due to the availability of these utilities from GRDA. This made is unnecessary to spend two to three million dollars for construction of steam and electric generation plants and water pumping station.

Steam is brought to the mill from the nearby GRDA plant at 150 PSI. Electricity is brought to the mill at 13.2 KV, 3 phase, 60 cycles and reduced to 2300 V and 440 V in the mill sub-station. Water is brought from the pumping station to the mill in a 12-inch transite pipe.

Mill sewage is taken care of in the GRDA sewage disposal plant.

Raw Materials

Almost 90 percent of the raw materials used in the mill are waste papers of various kinds, including mixed waste papers for the filler, kraft containers and corrugated waste for the bottom liner and blank or overissue news and sulphite and groundwood pulps for the top liner.

The raw materials are unloaded from railroad cars on an open siding at the south side of the building. A truck platform is also located on that side of the building.

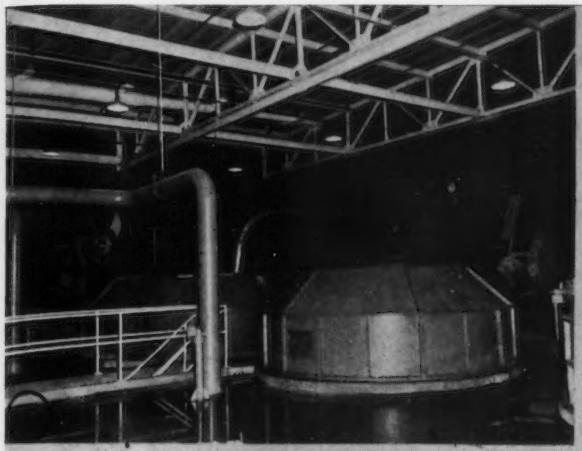
Bales are carried from the platforms by five Towmotor lift trucks into the adjacent warehouse or directly to the inclined conveyors located at the east end of the warehouse. Each bale is weighed on a Howe scale before delivery to conveyors. There are three of these Shartle conveyors, each six ft. wide by 50 ft. long. The conveyor belt has cross slats every few inches to provide traction for the bales being carried upward to the Hydrapulpers. Furnish is proportioned as it is delivered to the conveyor. That is, so many bales of each type of stock are

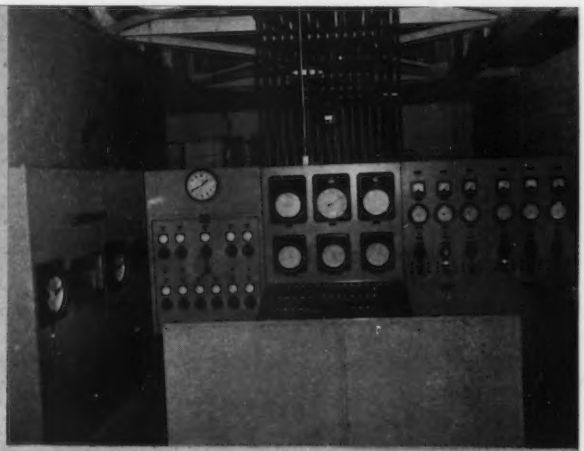
E. E. Nooe
Mill Superintendent

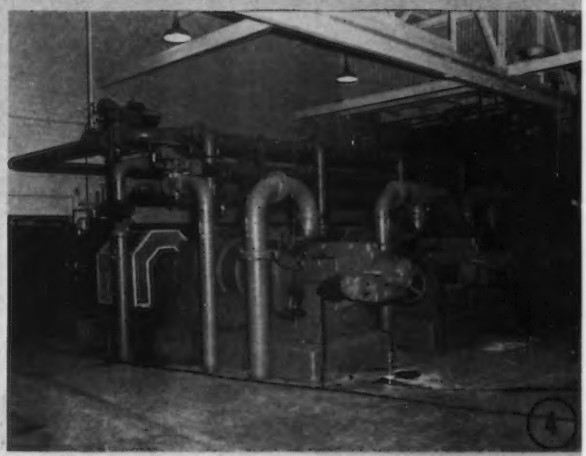
Paul J. Dumas
Plant Manager

Robert L. (Bob) Harris
Maintenance Superintendent

Figure 1—Shartle Hydrapulpers and Conveyors. Figure 2—Central Control Panels Located in Machine Room. Figure 3—Shartle Stock Cleaning Systems. Figure 4—Jordan Arrangements. Figure 5—Tending Side, Wet End. Figure 6—Cylinder Vat Circulating Layout.







delivered to a conveyor to make up a Hydrapulper batch.

The sizes of the three Hydrapulpers are as follows: filler 20 ft. dia.; top liner 14 ft. dia. and bottom liner 12 ft. dia.

The filler Hydrapulper is equipped with a junk remover that removes the coil of wire, rope, rags, etc. that is formed in the vortex of the machine and carries it out to a scrap truck. To facilitate collection of this junk, baling wires are cut and left on the bales as they are fed into the pulpers.

Stocks from the Hydrapulpers are dumped into their respective dump chests. Top liner and bottom liner stocks are then pumped from the dump

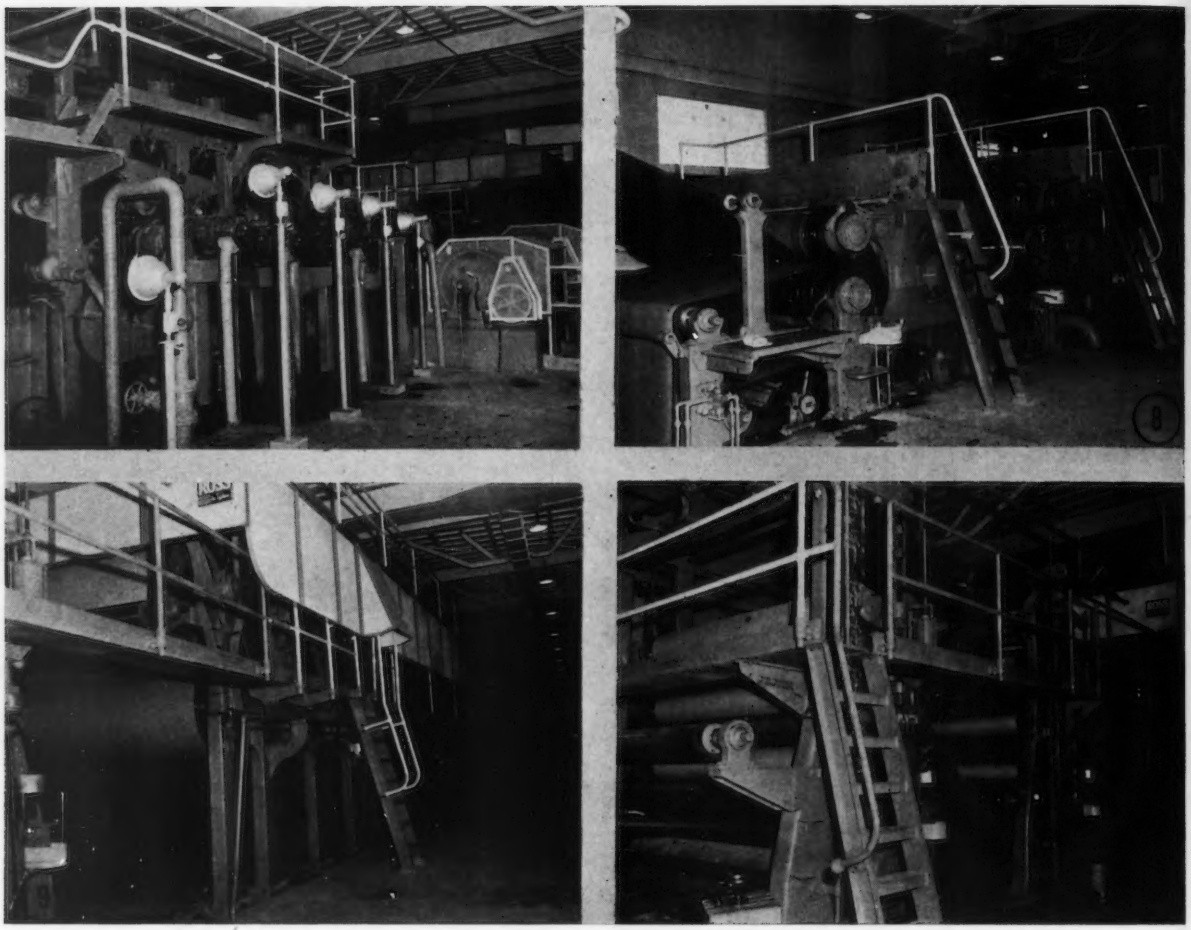


Figure 7—Back Side of Baby Press, Helper Drives and Flood Lighting Arrangement. Figure 8—Press Section. Figure 9—Dryer Section, Elevated to Illuminate Basement and Pit. Figure 10—Calender Stack Arrangement.

chests to the jordans then to their respective machine chests.

Stock from the filler Hydrapulpers is dropped into the filler dump chest from where it is pumped and diluted as it goes to three Hydrafuges and then to three Classifiers. Trailings are sent to a Selectrap. Accepted stock from the Classifiners is thickened in three Shartle deckers, before being pumped up to the jordans, from which it flows to the jordans and then to the filler machine chest.

There are six Shartle Miami 2A Jordans, each equipped with Duotrols and operated from the central control panel in the machine room. Each jordan is driven by a 200 HP synchronous motor rotating at 450 RPM and using 440 volt, 3 phase, 60 cycle current.

Rosin size emulsion is added to the liner stocks before the jordans, and alum is added to the stock in the machine chest. Additional alum is added in the vat mixing boxes. All of these are continuous automatic additions through Flowraters.

The six jordans are piped so that any number may be used on top liner, bottom liner or filler. All of the chests are tile lined and have midfeathers and propeller agitators, each driven by a 20 hp. 1750 RPM motor through a Falk reduction gear. The capacities of these chests are as follows:

	Gallons
Filler Dump Chest	45,000
Top Liner Dump Chest	13,650
Bottom Liner Dump Chest	10,300
Filler Machine Chest	13,650
Top Liner Machine Chest	10,300
Bottom Liner Machine Chest	10,300

In addition to the above stock chests, there is also one liner and one filler white water chest, tile lined, each having capacities of about 14,000 gallons.

Stocks from the three machine chests are pumped to the screen headboxes where they are diluted with white water before flowing down to the screens. There are eight of these Sandy Hill flat screens, one for each cylinder on the board machine. Each screen contains 14 plates and is driven by a three HP motor through a V-belt drive.

Since each screen serves one cylinder on the paper machine, the screens are arranged so that any number may be used for any of the three possible kinds of stock, depending on the kind of stock on each cylinder.

Accepted stock from each screen flows into its respective mixing box where it is diluted with white water from the vat. The white water from each of the eight vats is returned to its respective mixing box by the eight Shartle vat circulation pumps each driven by a 20 HP, 440 V. induction motor rotating at 705 RPM.

Paper Machine

The paper machine is a Black Clawson eight cylinder machine with counter flow vats. Cylinders are 48 inches with 116 inch faces. A maximum trim is 108 inches. The top speed is 500 FPM. The machine has a total length of 450 ft. and weighs 1½ million pounds.

Top and bottom felts are each approximately 200 ft. long.

Cylinders number 2, 4, 6 and 8

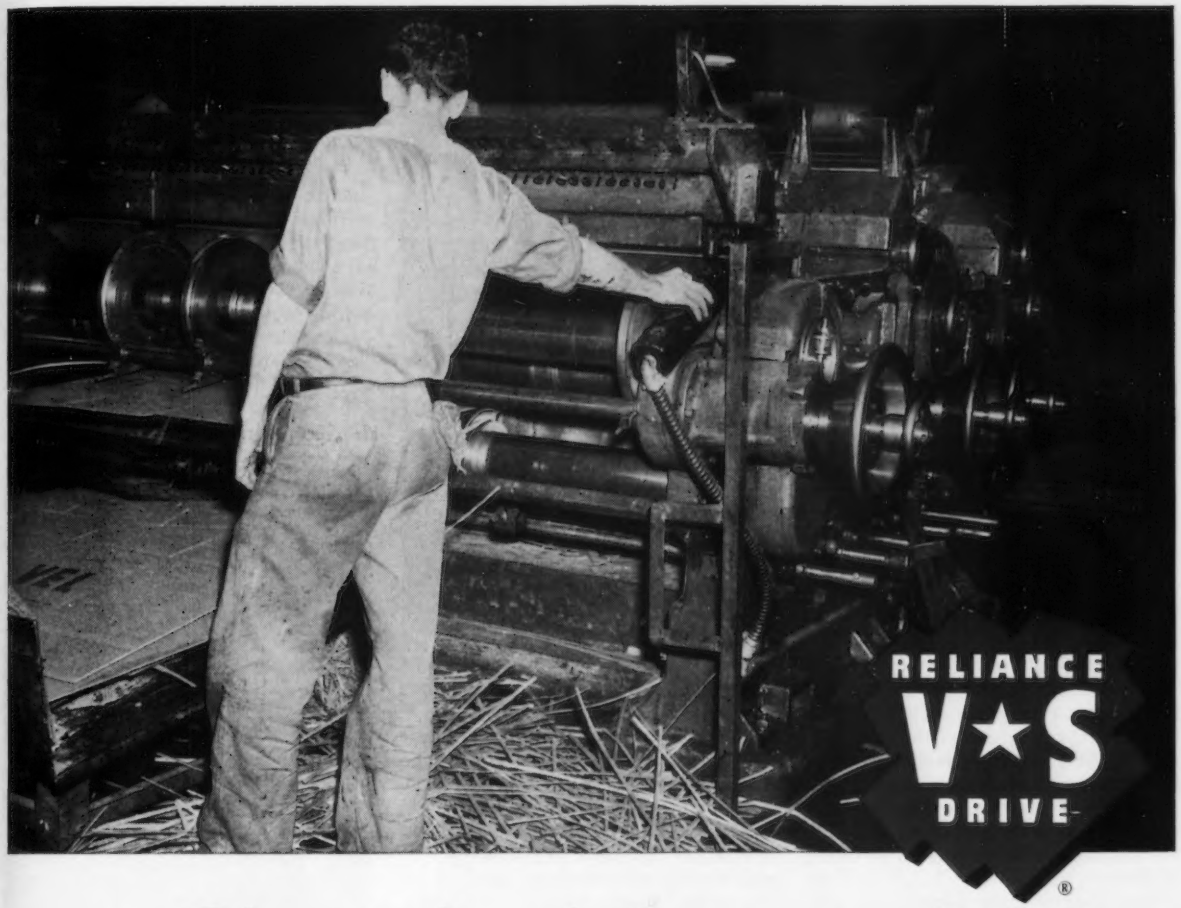


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Figure 11—Control Laboratory.

(numbered from presses toward wet end) are equipped with gearmotor auxiliary drives. Each drive has a five HP 230 V.D.C. motor with a speed range of 1790-2150 RPM. The gears provide a speed reduction of 60-1.

The machine is equipped with a suction extractor press through which the bottom and top felts and the combined sheet passes, just after leaving number 8 cylinder. The bottom suction roll is driven by a gearmotor similar to the cylinder auxiliary drives except that the extractor roll motor is larger being 15 HP.

The four primary presses are also equipped with gearmotor drives. The bottom rolls of the first primaries and both top and bottom rolls of number four primary press are each equipped with a 15 HP gearmotor drive similar to that used on the extractor roll. Number three primary press has a bottom suction roll. Thus the felts are relieved of the strains produced when they are required to drive the cylinders and primary presses.

There are three main presses, the first and third are plain presses and the second has a bottom suction roll. Each of these presses has its own felt.

All presses are loaded by means of a Foxboro hydraulic roll loading system, controlled from the central control panel.

Vacuum for the suction presses is supplied by four Nash vacuum pumps. Three of these are operating at 530 RPM and each driven by 50 HP, 1175 RPM motor through a 10 V. belt drive.

The fourth Nash pump, which supplies vacuum for the extractor roll, is driven at 350 RPM through a V belt drive by a 75 HP, 1175 RPM motor.

The dryer section, consisting of 100 four ft. dryers is divided into six subsections. The dryers are equipped with anti-friction bearings which are pressure lubricated by oil, fed through a Bowser system that filters and cools it before supplying it to the bearings under pressure.

A Sheahean rope carrier system eliminates the dangerous and undesirable job of manual threading of the dryers at starting and following breaks.

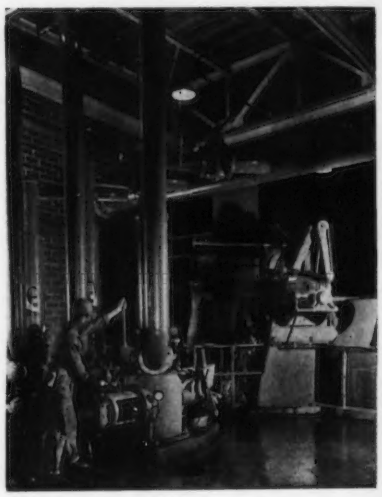

Figure 12—View of the Three Hydrafuges, the Selectrop and the Ragger on the Continuous Hydro Pulper in the Stock Preparation Room.

The dryers are completely equipped with doctors.

The entire dryer section is covered by a Ross fabricated from a steel frame and transite panels. A Ross ventilating and hot air system provides increased drying efficiency and reduces heat and humidity in the machine room.

There are two Black Clawson stacks the first of which has nine rolls and is equipped with two water boxes. These boxes are used to apply hydrolized starch surface sizings. A starch cooking room with two stainless steel make-up and storage tanks is located across the aisle opposite the calenders. The second calender is a straight seven-roll stack.

Calender stacks are loaded by a Foxboro hydraulic calender loading system controlled from a small panel opposite the calenders or from the central control panel opposite the press section.

Calender stacks may be reversed to clear jams by means of calender reversing drives.

Figure 13—Part of a Control Panel which Controls the Operations and Processes of the Entire Wet End of the Paper Machine. The Entire Operation May Be Supervised by One Man at this Point.

The reel is a Pope type constant speed unit. Full rolls of paper are transferred from reel to winder by a 7½ ton overhead crane.

The Cameron winder is a single shaft, double drum machine with shear slitters on the forward side. The winder is driven by a 230 V., 75 HP D.C. motor. Constant tension is maintained on the unwinding roll by an automatic brake.

Rolls are lowered from the winder to the floor by a hydraulic roll unloader. Finished rolls are carried by Towmotor lift truck from the winder into the adjacent roll warehouse with the enclosed railroad siding at its north side. Thus the rolls may be taken directly from the winder and loaded into railroad cars, or placed in storage until the time for shipment.

Paper Machine Drive

The paper machine drive prime mover is a 400 HP Terry steam turbine, connected to a line shaft. The turbine takes steam at 150 PSI and exhausts it at 25 PSI. Top speed is 3512 RPM.

The line shaft is connected to the machine through twelve sectional cone pulleys, flat belt drives, each connected to a Black Clawson right angle reduction gear. These sectional drives are located as follows: three on main presses, six on dryer sections, two on calender stacks and one on reel.

Overall speed of the machine is controlled by adjustment of the speed of the steam turbine. Draw adjustments are made through motor driven belt shifters on the cone pulleys. Both controls are made at the central panel board.

One of the features of this mill is central control panel located in a large bay across the aisle from the paper machine press section. The bay, which is almost 20 ft. long by eight ft. deep may be closed off from the machine aisle by means of a flexible metal curtain. This protects the instruments from water damage during wash-ups.

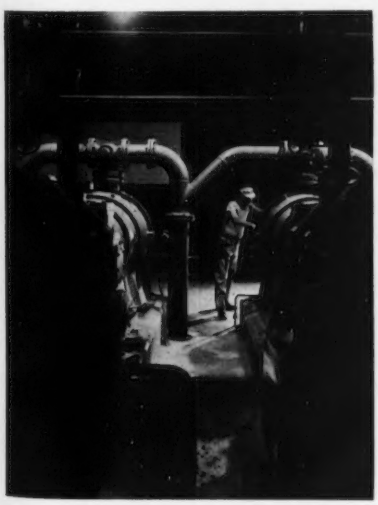

Figure 15—View between two of the Six Jordans which Refine the Fibers before they Go to the Head Box.

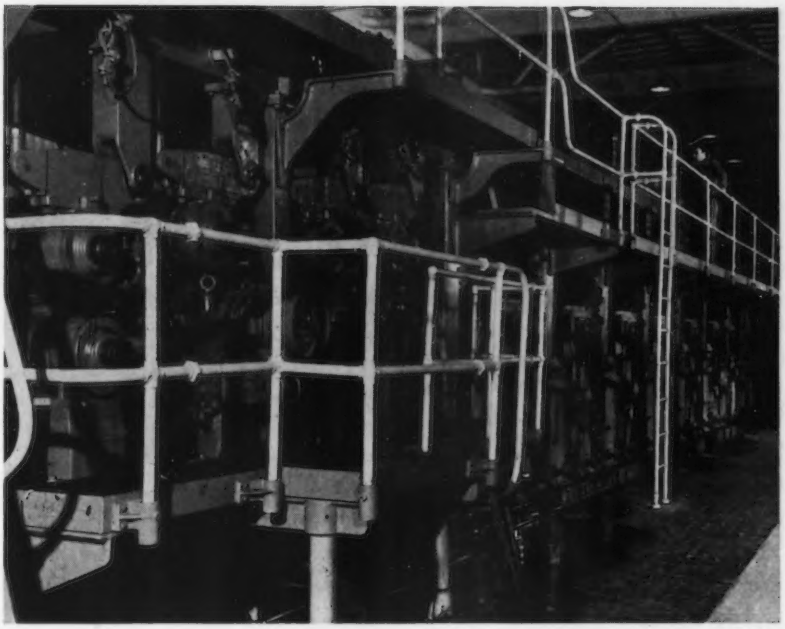

Figure 14—View of the Wet End of the Paper Machine with the Primary Press Section on the Left and the Eight Cylinders on the Right.

Included in the group of instruments are liquid level recorders showing levels in stock and white water chests; steam pressure and steam flow meters; flowraters showing rates of addition of size and alum to the stocks; recorders showing loading on presses and calenders by Foxboro hydraulic roll loading system; jordan power consumption, etc.

The controls are on a console located so that the operator faces the paper machine.

Controls are centralized here for starting and stopping pumps, agitator, jordans, etc. adjustments of jordan settings by Duotrols, speed and draw adjustments on the paper machine and temperatures on dryers.

Laboratory

A well equipped air-conditioned control laboratory is located near the dry end of the paper machine. Conditions in this laboratory are controlled at 50 percent relative humidity and 70° F.

Equipment in the laboratory includes: standard freeness tester; ph meter; centrifuge; analytical balance; basis weight scale; standard one ft. sq. sheet cutter; sheet cutter; two drying ovens.

Plant layout and process flow was conceived by L. L. Hank. Detail design was developed by W. J. Sprau. Plant engineering, construction and erection was supervised by the National Gypsum Co. Engineering Department located at the main office in Buffalo, N. Y. The following men were responsible for the successful design and construction: S. D. Skinner, Chief Engineer; W. I. Ritter, projec engineer; W. H. Wetzel, chief mechanical engineer; C. R. Cummings, chief electrical engineer, and L. E. Wilcox, chief combustion engineer.

The following plant executive and supervisory personnel responsible for the successful operation of the mill: Paul J. Dumas, Plant Mgr.; E. E. Nooe, Mill Superintendent; Robert L.

Figure 16—Finished Rolls of Paper are Loaded on Railroad Cars by Fork Lift Trucks. All Loading is Done in a Covered Area of the Plant.

Harris, Maint. Superintendent; William G. Gorman, Quality Superintendent; Ray R. King, Personnel and Safety; Charles M. Cass, Receiving; Robert N. Schnabel, Office Manager; L. R. Schultz, Purchasing Agent; Norbie C. Jacks, Tour Boss; Cecil L. Bullard, Tour Boss; W. C. Jackson, Tour Boss.

Equipment and Suppliers

Belting, B. F. Goodrich Co., and Graton Knight Co.

Vacuum Pumps, Nash Engineering Co., Inc.

Controls, Foxboro Co.; Bailey Meter Co., Inc.; Midwest-Fulton Machine Co.

Steam Joints, Johnson Corp.

Lubrication, Bowser, Inc.

Calender Rolls, Farrel-Birmingham Co., Inc.

Winder, Cameron Machine Co.

Motors, Electrical Equipment, General Electric Co.

Power Transmission, Dodge Manufacturing Co.

Screens, Sandy-Hill Iron & Brass Works, Inc.

Anti Friction Bearings, Timken Roller Bearing Co. and SKF Industries, Inc.

Trucks, Towmotor Co., Inc.

Cranes, Shepard Niles Crane & Hoist Co.

Pumps, Worthington Pump Co., Shartle Bros., and Buffalo Forge Co., Inc.

Scales, Howe Scale Co.

Metering Devices, Fischer & Porter Co.

Stock Chests, Kalamazoo Tank & Silo Co., Inc.

Paper Machine, Black-Clawson Co., Inc.

Hydrapulpers, Shartle Bros.

Hoods and Ventilation System, J. O. Ross Engineering Co., Inc.

Turbine, Terry Steam Turbine Co.

Steel, Ryerson Steel Co.

Sizing Systems, Hercules Powder Co.

Classifiners, Hydrafuges, Selectraps, Deckers, Jordans; Shartle Brothers Machine Co.

Contractors, Manhattan Construction Co., Spaeth Engineering Co., Beacon Electric Co. and Texas Automatic Sprinkling Co.

Reduction Gears, Falk Corp.

Certain-teed's Coronado Mill

The Certain-teed Products Corp. mill is located near the Couteau Power Plant of Grand River Dam Authority between Chouteau and Pryor, Okla. The thirty acre site on Pryor Creek (a tributary of Grand River) for the mill was purchased from a private estate thru the cooperation of the local Chamber of Commerce, and the U.S. Corps of Engineers.

Construction of the mill started in February, 1951 and was completed in July of this year. Operation started the end of July.

Engineering and planning for this mill was done by General Engineering Div. of Certain-teed Products Corp., Ardmore, Pa. W. G. Will, Chief Engineer, was responsible for the original design and plant layout. Helge Johnson was project engineer and Jim Burkhart was assistant project engineer, remaining as plant engineer after construction was complete.

The mill was designed to produce approximately 100 tons per day of liner for gypsum wallboard. There are several different weight and grades of this product but they are all used for the same purpose.

Although some virgin pulps are used in the top liners of some grades, a very high percentage of the raw materials used are waste papers.

Raw material for the filler stock normally consists of mixed waste papers, raw material for the liners may consist of blank or over-issue news, kraft container waste or virgin pulps.

The plant has one large main building 500 ft. long by 190 ft. wide, the long dimension being north and south.

A large divided warehouse 360 ft. long by 140 ft. wide ocupies the southwest corner of the building.

The building has a structural steel frame, with the lower part brick and the upper part corrugated asbestos (Asbestone Corp.). Height at the eaves is 40 feet. Owens-Corning Fiberglas is used for building, roof, and pipe insulation. The roof is covered with Certain-teed built-up roofing.

The main railroad siding, connecting with the Missouri, Kansas, Texas Railroad, extends along the loading platform on the west side of the building. This siding holds eight railroad cars. A five car siding extends along the Southern half of the east side of the building.

The warehouse is used for the storage of both the bales of waste paper used as raw material and the finished rolls of paper. These rolls are brought directly from the paper machine winder into the south section of the warehouse.

A large area, 200 ft. by 500 ft., adjacent to the west side of the building, is paved with concrete and is used for outdoor storage of waste paper bales. Between this paved area a concrete dock, 56 ft. x 155 ft., adjacent to the siding and truck road, was built at track level to facilitate unloading of bales of paper. Ramps from the raised portion to the ground level allow bales to be transported to the lower level by lift truck. Another ramp and lift bridge over the railroad siding allows lift trucks to carry bales up into the north section of the warehouse where they may be placed on the inclined conveyors leading up to the pulpers.

There are three of these Korb-Petit inclined conveyors each leading up to the top of a Downingtown Fiber-Pulper. Each conveyor is 84 inches wide and 50 ft. long and is equipped with a chain mesh belt. Two of the pulpers, for top liner and bottom liner socks, are 10 ft. in diameter. The third, for filler stock, is 12 ft. in diameter. All units are Downingtown Fiber-Pulpers with clover-leaf cross-section.

Although the system was designed to handle three different kinds of stock, many of the grades require only two kinds of stock.

The 12 ft. pulper for filler stock is equipped with a junker and ragger which takes out baling wire, rags and other large pieces of foreign materials and carries them up on conveyors to a point where they are discharged into a container for removal from the mill.

Defibered paper is extracted continuously from the side of the filler pulper through a perforated plate with ¼ inch diameter holes. In the liner or

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L-R—Helge Johnson, General Engineering; J. W. Hart, Mill Manager; W. H. Young, Superintendent; Jim Burkhart, Plant Engineer.

L-R—J. H. LeFevre, Downingtown Mfg. Co.; L. J. Magee; L. A. Sawyer; Engineers for Certain-teed.

batch pulpers the holes are in bottom and are one inch in diameter.

Stock from each of the pulpers goes into its respective dump chest. Each liner stock system has a Fibrefiner, cycling and Jordan chests. The filler stock from the Fibrepulper is pumped to two Downingtown Fiber cleaners, then to two Fibrefiners, diluted to 0.5 percent, then pumped to three Vortraps. The stock is then thickened on two Downingtown deckers. Filler stock then is pumped to the refining chest for further refining thru one Fibrefiner. Other stock preparation equipment includes three Brammers, five Emerson 1B Jordans, and four machine chests.

The Fibrefiners, built by Downingtown, were developed from Weiner refiners. Each machine is directly connected to a 150 HP, 1750 RPM Westinghouse induction motor.

Each of the five Emerson jordans is driven by a Westinghouse 150 HP, 514 RPM synchronous motor.

Each beater is driven by a Westinghouse 200 HP, 504 RPM induction motor through a V-belt drive containing 16 belts. Beater tubs are 40 ft. long and four feet deep with channels 42 inches wide.

Each of the five beater chests has a capacity of about three tons of stock at four per cent consistency and each machine chest holds about 1500 lbs. of stock at four per cent consistency.

All of the chests are concrete and equipped with midfeathers and propellor agitators to provide good circulation and allow cyling. The adjustable pitch agitators are driven by Westinghouse 15 HP, geared motors with the motor operating at 1750 RPM and the agitator shaft rotating at 100 RPM.

Before going to a machine chest each stock is sent through one of the jordans. This arrangement is very flexible and allows wide variation in degrees of treatment of the stocks.

All equipment in the mezzanine stock preparation room including pulpers, jordans, beaters, screens, etc., as well as fibrefiners, pumps and agitators located on the lower floor are controlled from several Westinghouse control panels grouped for visbility and efficient operation. Indicating lights are provided for "off-on" visual inspection.

Shartle remote control stock valves are used on all of the principal stock lines.

A useful feature of this mill is the pipe-line color coding. All pipes handling filler stock are painted dark gray, those carrying top liner stock are light grey and bottom liner, medium grey. Fresh water lines are painted dark green and white water lines are pastel green. Electrical lines are blue, air-yellow, kerosene-aluminum, size - purple, drains - black, suction-brown, and steam valves-alert orange.

An Oliver vacuum filter located in the stock preparation room is used as

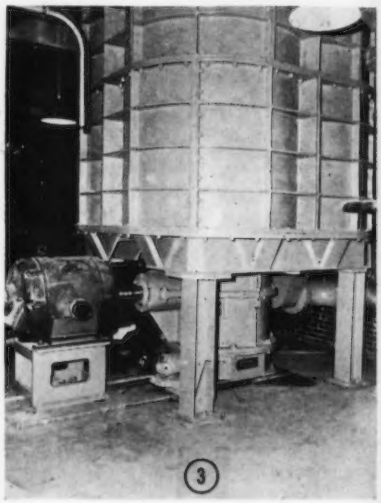


Figure 3—Bolton Drive of Downingtown Fiber-Pulper.

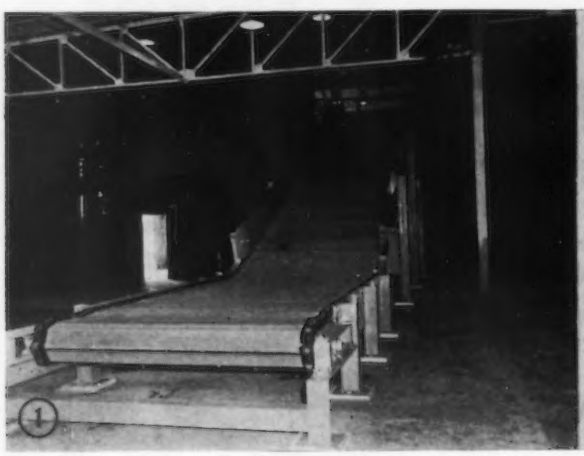
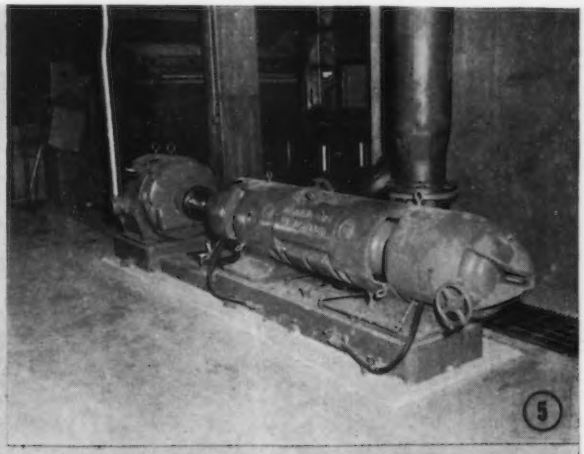
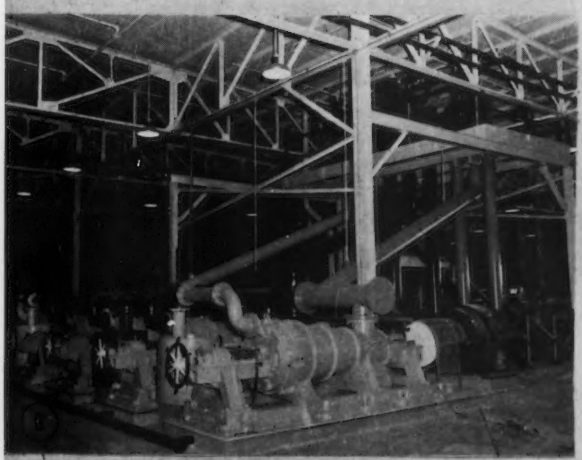
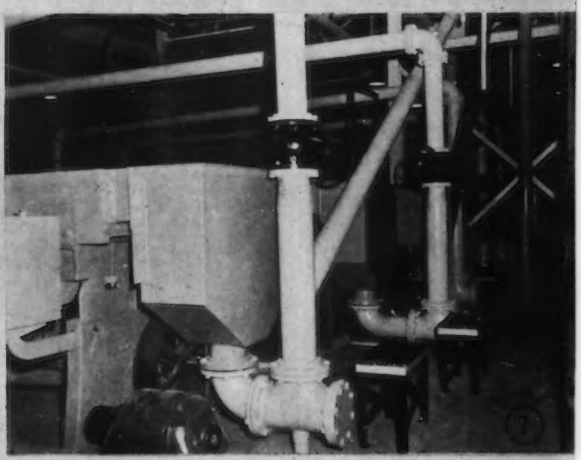


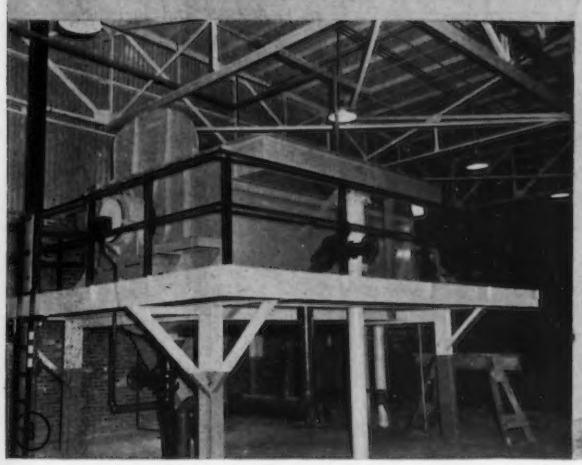
Figure 1—Korb-Petit Bale Conveyor. Figure 2—Topside Downingtown Fiber-Pulper.

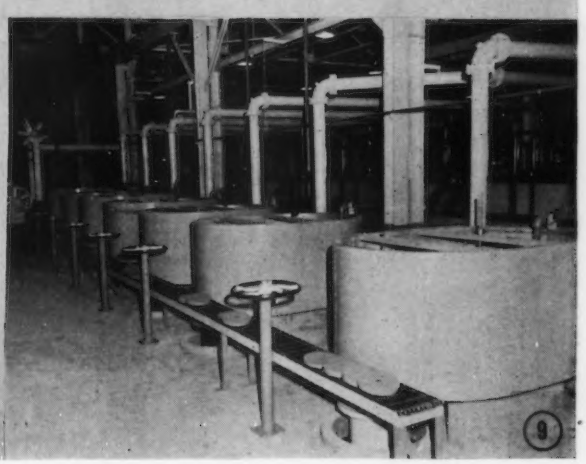
Figure 4—3000 lbs. Downingtown Beaters. Figure 5—Downingtown Fiberfiner. Figure 6—The Emerson Jordan installation. Figure 7—Stock Inlets on Flat Screens. Figure 8—Oliver Vacuum Save-All. Figure 9—Streamlined Mixing Boxes.









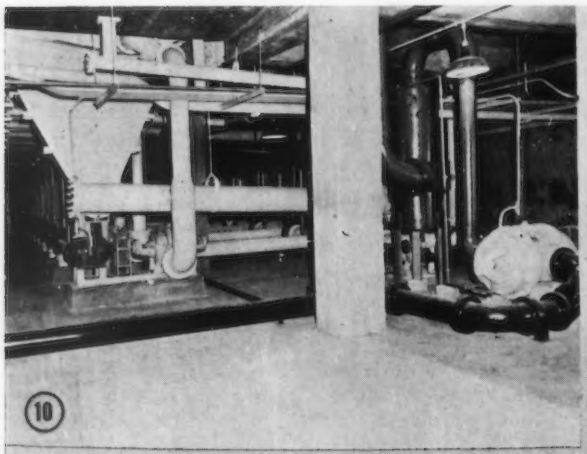


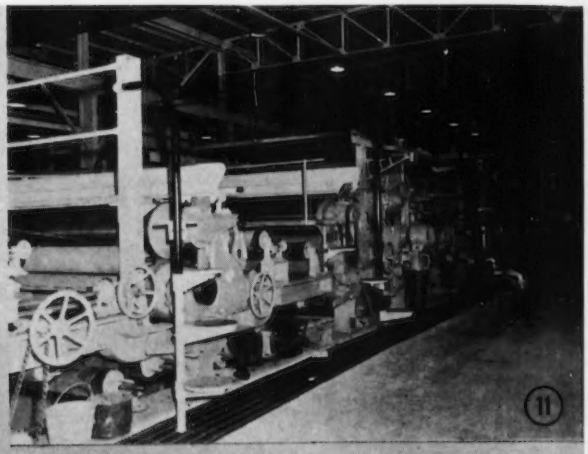
a saveall for recovery of stock from the white water. Recovered stock is returned to the filler system. This machine has a cylinder 8 ft. in diameter by 10 ft. long and is driven by a 7½ HP Reliance variable speed D. C. motor through a Cleveland reduction gear. A five KW Reliance MG set panel provides direct current and speed regulation for the saveall motor.

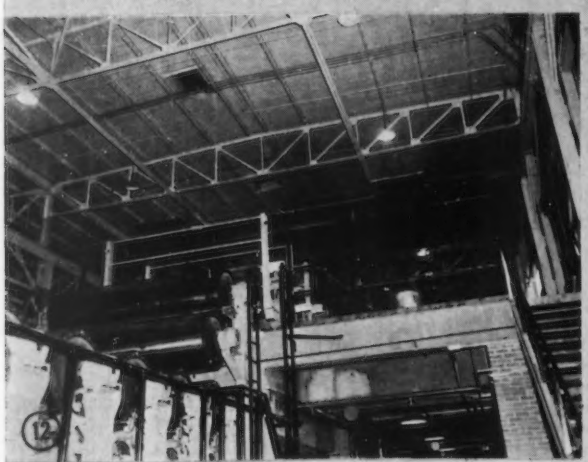
There are three Brammer consistency regulators that adjust the consistencies of each type of stock as it goes to the jordans and machine chests.

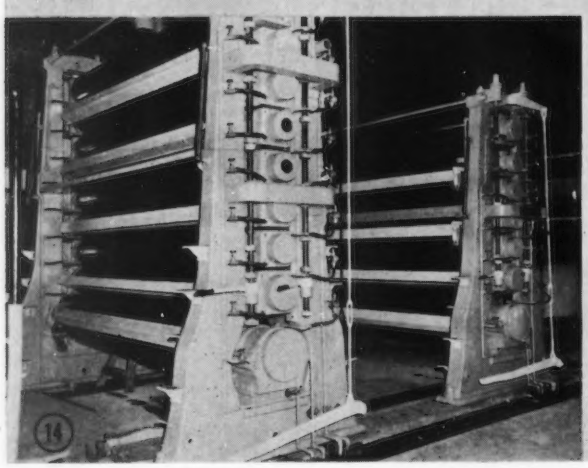
Stocks from the machine chests are pumped to the regulating boxes and are diluted with white water to one per cent consistency before going to the screens. There are seven of these Sandy Hill Packer flat screens each having 14 plates. Each screen handles the stock for one cylinder and the accepted stock from each screen goes to

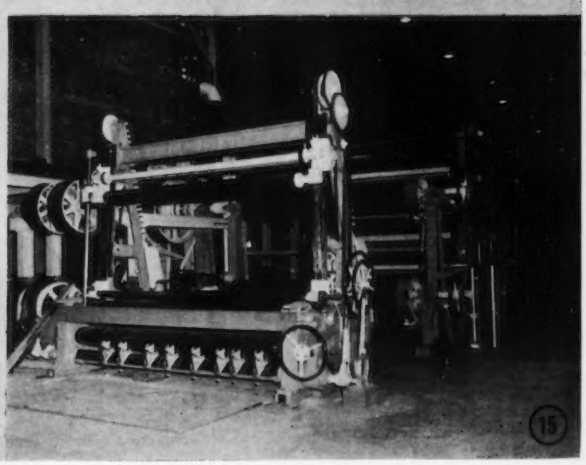
Figure 10—Economy Cylinder Vat Circulating Pumps. Figure 11—Downingtown Press Section. Figure 12—Drop-down from Mezzanine to Dryer Floor Level. Figure 13—Dryer Section. Figure 14—Calender Section. Figure 15—Reel and Winder Section.











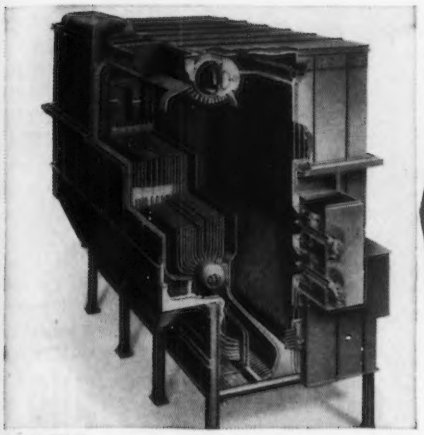
its own respective mixing box. In each mixing box the stock is blended with white water drawn from inside the cylinder of its own vat, thus reducing the consistency to about .2%. White water from each cylinder is pumped to its mixing box by its own respective circulation pump. The seven mixing boxes are all 5 ft. wide by 7 ft. long, oval-shaped, fabricated from stainless steel sheet.

The seven vat circulation pumps are 2500 GPM, 15 ft. head units supplied by Economy Pump Co., Hamilton, Ohio. Each pump is driven by a U. S. 15 HP, 900 RPM induction motor.

The paper machine which is 124 inches wide and trims 112 inches, is a seven cylinder rebuilt machine supplied by Downingtown Mfg. Co.

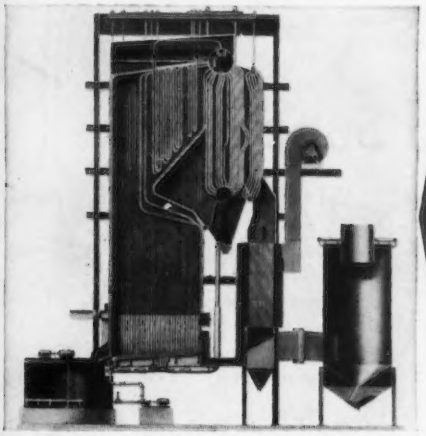
The vats are all counter flow with cylinders 36 inches in diameter. The machine is equipped with two extractor rolls, one suction, one plain.

The bottom felt has a length of 160 to 172 ft. and the top felt has a length of 171 to 181 ft. There are four pri-

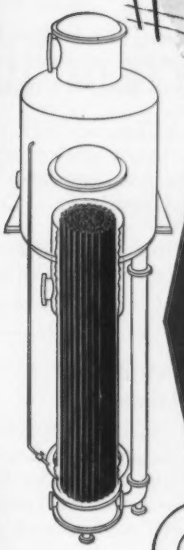


BOILERS—B&W boilers have a long and outstanding record for low-cost steam generation in pulp and paper mills. They span a range of types and sizes to satisfy every requirement of capacity, space, temperature, pressure, fuel, and method of firing. Each type combines the dependability of job-proved design with every economy of standardization commensurate with flexibility.

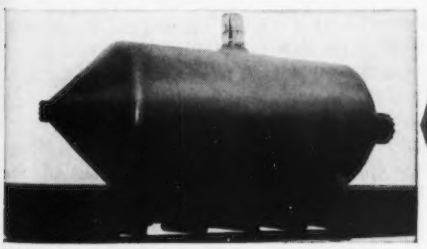
time-proved aids to **LOW COST** production



RECOVERY UNITS—Efficient chemical recovery and reduction, along with maximum steam generation per ton of pulp, are combined with economical operation and maintenance in B&W Recovery Units. Installations for burning waste liquors of the kraft, soda, and bisulphate (magnesium, calcium, and ammonium) processes have a total recovery capacity of over 16,000 tons. B&W recovery units were the first provided with automatic soot blowers to eliminate routine hand lancing.



TUBES—Seamless and Welded steel tubes are made by B&W in a range of carbon, alloy, and stainless steel analyses to satisfy every requirement for condensers, evaporators, heat exchangers, recovery units, boilers, and other paper mill applications. Modern improvements in pulp and paper processes impose a greater variety of tubing requirements than ever before. B&W Tube Representatives offer a wealth of experience on tubing problems to help users determine the analyses best suited for specific operating conditions.



PRESSURE VESSELS—Dependable welded processing units, in sizes and shapes for any paper mill requirements, are fabricated by B&W from carbon, alloy, or clad steels. All vessels are x-ray inspected and stress relieved.

B&W **BABCOCK & WILCOX**

THE BABCOCK & WILCOX COMPANY

P-766

mary presses followed by a suction press and three plain presses. From the third press the sheet travels down from the mezzanine to four dryers in a single vertical stack and then goes to the other dryers all arranged two-high on the first floor level.

There are 93 of these dryers, all 36 inches in diameter with 124 inch face and equipped with sleeve bearings.

A DeLaval pressure lubrication system feeds oil to the bearings through sight glasses.

The two calender stacks contain seven and nine rolls respectively, all supplied by Lobdell Co. Both calender stacks are equipped with Downingtown reversing drives with the gears supplied by Philadelphia Gear Co. The reel stand contains two conventional steel tubing drums, equipped with adjustable tension, flat slip-belts and pulleys.

The Cameron, double drum, single shaft, winder, is equipped with score cut slitters.

A hydraulic elevator serves as a table to hold the rolls of paper from the winder and lowers them to the floor. This machine was built by Rotary Lift Co., Memphis, Tenn.

A Toledo Printweigh scale which provides a printed record of the weight of each roll, is located near the winder.

The machine is driven by a 300 HP D.C. Westinghouse motor through a line shaft with cone pulleys and flat leather belts. The drive motor is connected to the line shaft by a multi-V-belt drive. The drive was built by Downingtown but includes some Falk & Philadelphia reduction gear units. Direct Current for the drive motor is supplied by a 380 HP Westinghouse M. G. Set.

Paper Machine Auxiliaries

Vacuum for suction press rolls, etc., is supplied by three Nash pumps, two of which are size L-7, each driven by a Westinghouse 50 HP 1175 RPM induction motor through a multi-V-belt drive. The third Nash pump is type 6, driven by a 60 HP, 1175 RPM G. E. induction motor through a multi V-belt drive.

All speed and draw adjustments on the machine are made from a control at the front side. Overall speed is controlled by the D. C. drive motor, and draw adjustments are made by electric motor driven belt shifters on the cone pulleys.

Dryers are equipped with Johnson steam joints and a Midwest-Fulton condensate drainage system. The main steam control valve was supplied by Fischer Valve Co.

All woolen felts on the machine are kept clean with Vickery felt conditioners. All roll doctors were supplied by Lodding and the showers are by Broughton. The rubber rolls were covered by American Wringer Co.

At the time of starting up, the machine was not equipped with a hood but this may be added at a later date. Several large stacks and ventilating fans remove vapors from the roof above the dryers. Modine unit heaters will be used for heating the building in wintertime.

Utilities

All utilities are purchased at cost from Grand River Dam Authority, a non-profit government organization.

A 16 inch steam line, about one mile long, brings steam to the mill at 50 psi and at a cost of approximately 20 cents per 1000 lbs.

Water is brought to the mill property line in a 12 inch transite pipe. An eight inch C. I. pipe carries the water into the main building. About one million gallons of water will be supplied to the mill daily at a cost of five cents per thousand gallons.

Electricity is supplied from the GRDA power plant for about 5 mills per kwhr. and is brought in at 13.2 KV, 3 phase, 60 cycles, to a 4000 KW sub-station at the mill. Voltage is reduced at the sub-station to 2300 and 440 for distribution throughout the mill.

All motors in the mill of 50 HP or more use 2300 V, 3 phase, 60 cycles. Motors less than 50 hp use 440 volts, 3 phase, 60 cycles. There are 152 motors now installed in the mill, with a total of 4300 connected hp. Lighting circuits are 110 volt, 60 cycle single phase, having a load of approximately 200 KW.

Personnel

Key men who are responsible for the successful construction or subsequent operation of this mill are Helge Johnson, Jim Burkhart, Al Adams, L. J. Magee and L. A. Sawyer, Engineers; J. W. Hart, Mill Manager; and W. H. Young, Superintendent.

Equipment and Suppliers

Insulation, Owens Corning Fibre Glass Co.

Fiber-Pulper, Downingtown Mfg. Co.

Bale Conveyors, Korb Petit Wire Fabrics & Iron Works, Inc.

Vortraps, Nichols Engineering & Research Corp.

Deckers, Downingtown Mfg. Co.

Fiberfiners, Downingtown Mfg. Co.

Jordans, Emerson Mfg. Co.

Brammer Consistency Controls, Pandia, Inc.

Save-All, Oliver United Filters, Inc.

Flat Screens, Sandy Hill Iron & Brass Works.

Vat Circulating Pump, Economy Pump Co.

Paper Machine, Rebuilt by Downingtown Mfg. Co.

Pressure Lubrication, De Laval Steam Turbine Co.

Winder, Cameron Machine Co.

Vacuum Pump, Nash Engineering Co.

Condensate Drainage, Midwest Fulton Machine Co.

Rubber Rolls, American Wringer Co., Inc.

Doctors, Lodding Engineering Corp.

Steam Joints, Johnson Corp.

Smith-Lee Distributes Canco Containers

Smith Lee Company, Inc., Oneida, N. Y., has completed arrangements with the American Can Co. for distributing Canco paper milk containers to the small and medium sized dairyman.

The company has developed a paper milk container filler necessary to fill and seal the containers which will be known as the Cox filler.

Smith-Lee's distribution of these items will provide an economical installation enabling dairymen in these categories to meet the competition resulting from the trend toward paper packaging of milk on wholesale business.

The Cox filler will have its initial showing in the Smith-Lee's booth at the 18th Dairy Industries Exposition in Chicago, September 22-27.

Students Tour K-C Plant

Six university students from England were the guests recently of the Kimberly-Clark Corp., Neenah, Wis. The students are on an eleven-week tour of the United States sponsored by the Gen. Leonard Wood Foundation. The Wisconsin firm was selected as representative of the paper industry.

COLOR gives you a hold on your market!

It makes sense to sell a store executive on the advantages of colored wrappings, boxes, bags and gummed tape.

And once you've sold him, it'll be easy to hold him! He'll know that you have developed a distinctive color theme for his store . . . and that you have developed an *extra* merchandising tool for his store.

So go after this big potential market for colored paper. Turn to Du Pont's technical-service experts for help on any specific coloring problem. They will help you to give stores a truly distinctive package color that they'll want to keep using year after year—packaging they'll buy from *you* consistently!

For details, write E. I. du Pont de Nemours & Co. (Inc.), Dyes and Chemicals Division, Wilmington 98, Delaware.

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Du Pont basic dyes

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Du Pont acid dyes

FOR MAXIMUM LIGHT FASTNESS
Du Pont dispersed organic pigments:
Monastral* Fast Blues
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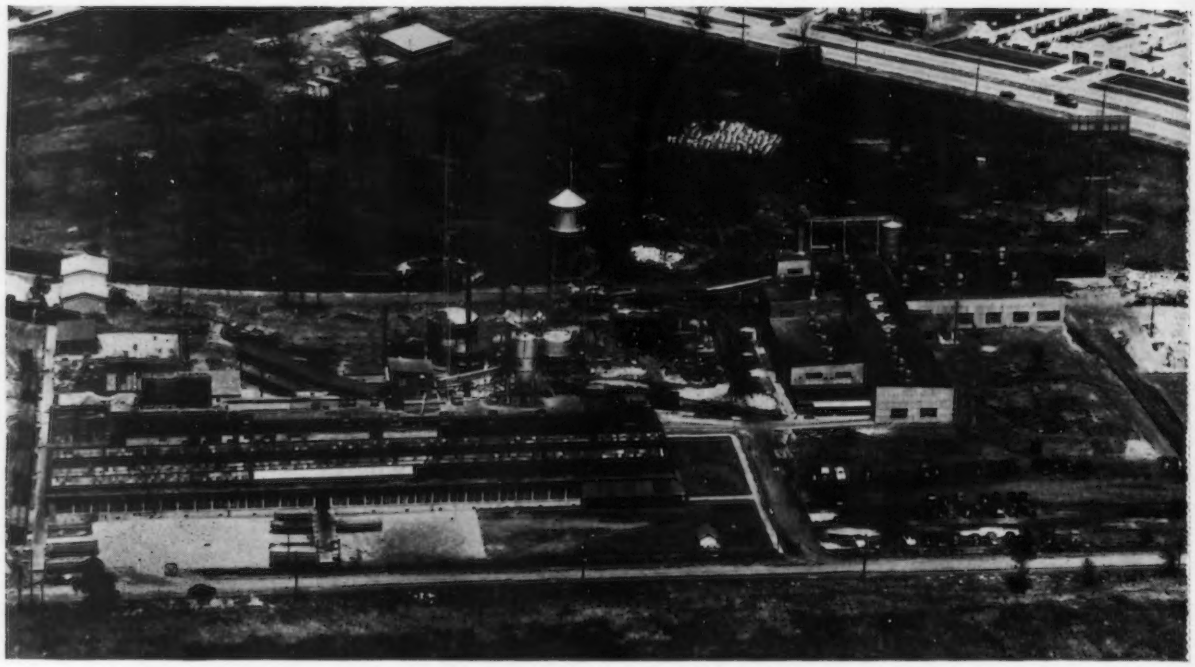
150th Anniversary
BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

More color makes more business . . . for your customers and you



Bird's Felt Mill at Shreveport More Than Doubles Capacity

This is a story about a new mill but one of the oldest companies in the U. S. The new mill is the Bird & Son mill at Shreveport, La., but the history of the company dates back to 1795 when George Bird established the first mill.

Other highlights in the long history of this company are as follows: 1812, Bird made paper for U. S. currency; 1824, first Bird patent issued, signed by John Quincy Adams; 1845, second paper machine installed at Bird's; 1850; third paper machine installed; 1885, Neponset Black Waterproof Building Paper; 1888 initial work begun on hand printed flooring material; 1894, Paroid Roofing; 1912 machine printed floor covering produced; 1926, machine made double-surfaced thick-butts; 1929, art bric siding, 1932, insulated bric siding; 1939, master-bilt shingles; 1947, insulated shingle siding; 1948, deeper protective saturation of insulated siding; 1949, architect shingles; 1950, new process armors all insulating siding.

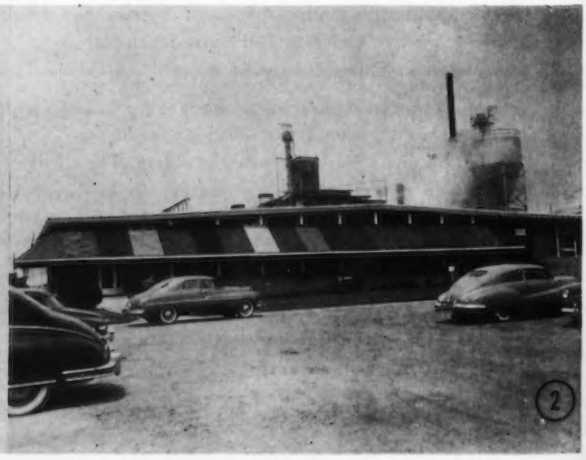
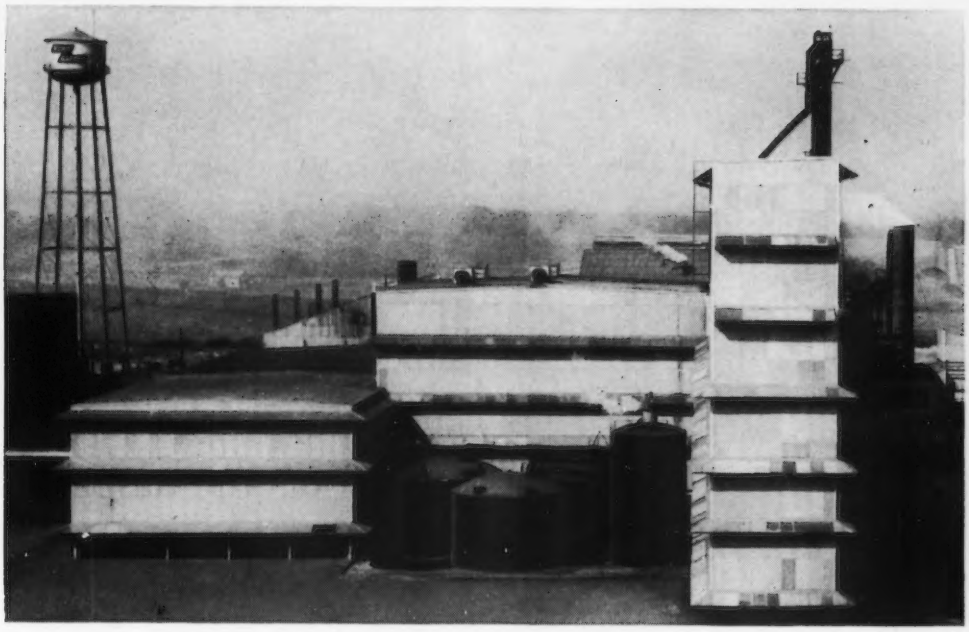


Figure 1—L.-R., L. L. Williams, Manager; B. P. Soward, Superintendent; N. R. McNeil, Assistant Superintendent; A. C. Shepard, Chief Chemist; R. N Potter, Chief Chemist. Figure 2—Main entrance to plant, note test panels.

Insul-Mastic Goes to Work at St. Regis



These three black liquor tanks and the taller foam tank are some of the many vessels that are protected with Insul-Mastic *Superior* Coatings at the great, new St. Regis mill. Corrosion of the tanks has thus been prevented, but the Insul-Mastic *Superior* Coating does more than that. Vessels in the mill operate at temperatures of 180° F. to 220° F.

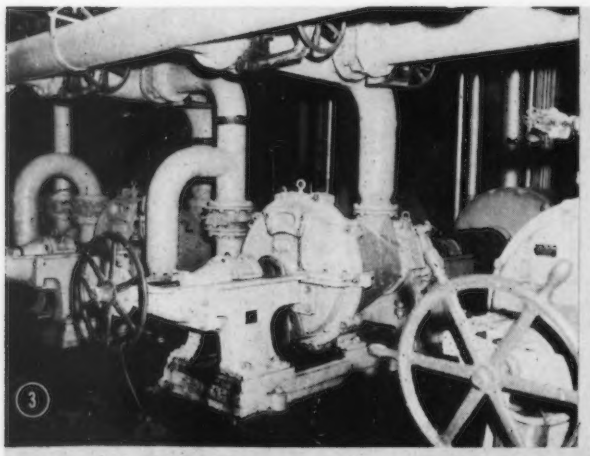
By using Insul-Mastic Type "D", *the coating that insulates,* the St. Regis Paper Company will prevent up to 65% of heat loss from these vessels. This also will mean a great fuel saving.

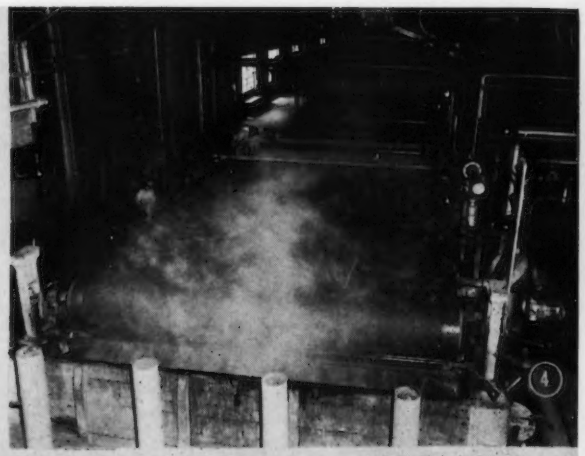
Insul-Mastic's *Superior* Coatings have proven their durability and quality in similar installations throughout industry. Both the Vapor Barrier coatings and the Type "D" Insulation are made to resist severe corrosive elements. The acute acid, alkali and moisture conditions of a paper pulp mill cannot harm them.

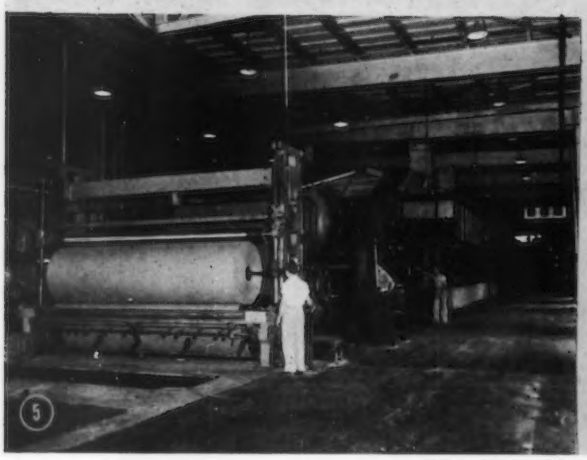
Before specifying coatings for your mill, talk to your nearest Insul-Mastic licensee. We'll gladly give you his name.

Insul-Mastic Corporation
OF AMERICA
OLIVER BUILDING · PITTSBURGH 22, PA.
Representatives in Principal Cities

INSUL-MASTIC COATINGS
CORROSION PROOFING
WATERPROOFING
VAPOR SEALING
INSULATION







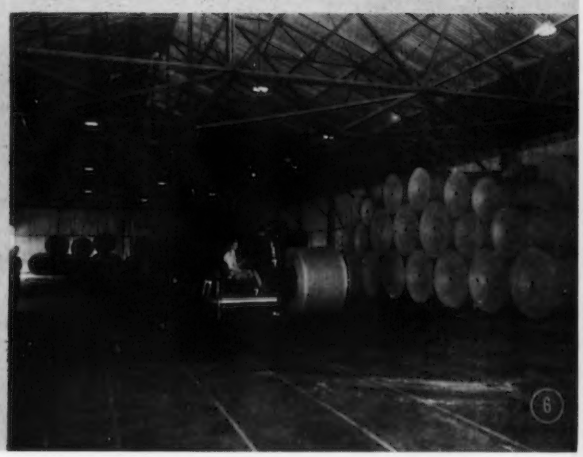


Figure 3—Battery Claflin Refiners. Figure 4—Wet-End Single Cylinder Beloit Machine. Figure 5—Dry-End Paper Machine. Figure 6—Finished Stock Storage.

Meanwhile the company has expanded from the original paper mill to the following: paper mill, box plant and home office at East Walpole, Mass.; felt mill and insulating board mill at Phillipsdale, R. I.; flooring, roofing and granule plants at Norwood, Mass.; Felt mill and roofing plant at Shreveport, La.; roofing plant at Chicago, Ill.; granule plant at Glenwood, Ark. Berry Asphalt Co. is a wholly owned subsidiary with plants at Waterloo, Ark. and Stephens, Ark.

Shreveport Mill

The felt mill at Shreveport, La. was designed and constructed by Rust Engineering Co. The first unit built there was the roofing plant, completed in 1937.

The felt mill began operation in November 1949 but has just been expanded to more than double its original capacity.

This mill was designed to make roofing or flooring felt from rags, waste paper, semi-chemical fiber and wood flour.

Semi-Chemical Pulp

Production of semi-chemical pulp in the original mill was about 25 tons per day from a Chemi-pulper. This was supplemented by about ten tons per day of groundwood screenings purchased from Southland Paper Mills. The first step in the expansion program was the installation of two more Chemi-pulpers, one of which has been in operation several months and the third unit having just recently started up. The three units are identical, each having two 18 inch diameter reaction tubes followed by an Asplund Defibrator.

Wood Supply

Pulpwood is brought to the mill in five feet lengths almost entirely in trucks by local producers. The requirements are compaatively small, about 50-60 cords per day. Originally only about 20-30 cords per day were required. Woods used are mostly hard wood. Since the mill chipper is small, any sticks over eight inches diameter must be split before delivery to the mill.

The wood may be unloaded directly into the drag link conveyor leading to the chipper or it may be placed in the adjacent storage yard. The drag link conveyor is inclined upward from the unloading trough to the mezzanine on which the chipper is located. The original conveyor installation extended out about 100 feet from the chipper house but this has recently been extended an additional 75 feet to provide more unloading space.

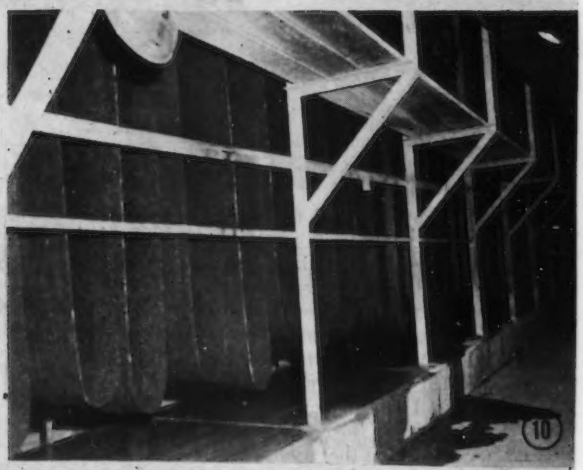
The 36 inch 10 knife Carthage chipper is driven by a Westinghouse 150 HP A. C. variable speed motor through a multi-V-belt drive.

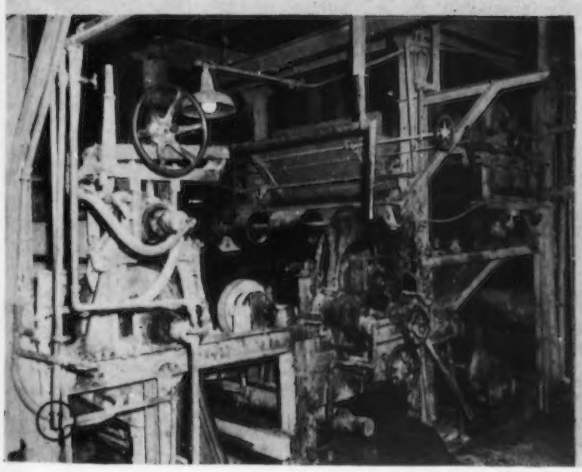
Pulping System

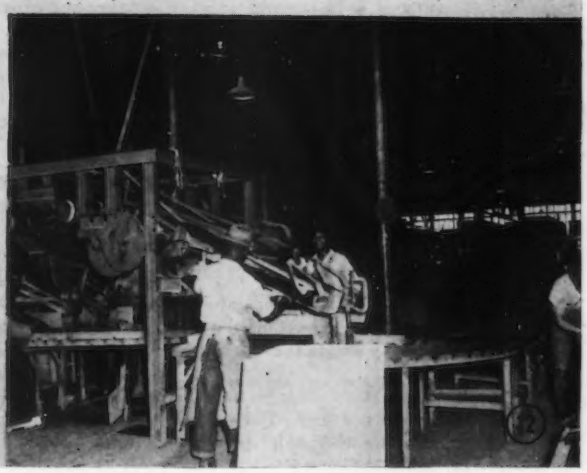
The pulpwood is chipped and used in rough form with the bark included.

Chips are carried from the chipper up in a bucket elevator and flight conveyor to three chip silos located above the three Chemi-pulper units. Each of the three silos holds approximately 100 tons of chips. Chips from the hop-

Figure 7—Dry Felt Accumulator Roofing Mill. Figure 8—Saturator Roofing Mill. Figure 9—Strike-In Section Roofing Mill. Figure 10—Cooling Looper Roofing Mill. Figure 11—Overlay Coating Section Roofing Mill. Figure 12—Shingle Machine Take Off.







per bottom of a silo flow ino the feeder of its respective Chemi-pulper, where they are mixed with caustic cooking liquor, and steam at 150 psi. After passing through the reaction chamber tubes, the softened chips are disintegrated in the Asplund Defibrator. The pulp is blown to cyclones and dropped into the wood chest.

In addition to the storage chest for wood there are five concrete chests, used as follows: one for waste paper stock; one for rag stock; one machine chest for mixed stock after refining; one white water chest and one chest for clarified white water.

Stock Preparation

The semi-chemical stock is pumped from the wood chest up to a proportioning box from which it flows

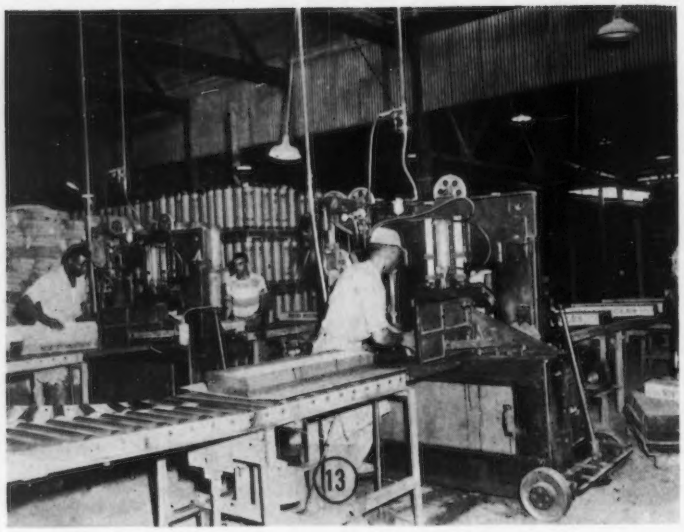


Figure 13—Tying Machines Roofing Mill.

through a Claflin refiner into the finished stock chest. The Claflin refiner is driven by a direct connected 200 HP 440 volt 380 RPM General Electric Induction motor.

Until the completion of the recent expansion project the waste paper was defibered in a Dilts breaker beater driven by a 150 HP General Electric induction motor through a motor-V-belt drive. The waste paper is now handled by a 14 foot Shartle Hydrapulper equipped with ragger and junk remover. The Hydrapulper is driven by a 150 HP motor through a reduction gear. Stock from the Hydrapulper is pumped into a settling through and flows into a thickener thence to the waste paper storage chest from where it is pumped to the proportioning box and to the finished stock chest.

Bales of mixed rags are brought to the mill in freight cars or trucks and kept in a storage space adjacent to the beater room until needed.

Rags are shredded by a pair of Taylor Stiles rag cutters and delivered to a belt conveyor that takes them to three Dilts ragbeaters.

The rag cutters are enclosed and equipped with an exhaust system that carries all dust away from the operation.

The three rag beaters have a total capacity of 75 tons per day. Each is driven through a multi-V-belt drive, by a 440 volt, 150 HP General Electric motor. Beaten rag stock from the beaters drops into the rag stock storage chest from where it is then pumped up to a proportioning box. The stock flows by gravity from the proportioning box through two Noble & Wood Bulldog Jordans, then into the finished stock.

When roofing felt is made, no rag stock is required but about 5% of wood flour is used. The balance of the furnish consists of waste paper stock and semi-chemical pulp.

When flooring felt is made about 50% of the furnish is rag stock with the balance being waste paper and semi-chemical wood fiber.

The mixed stock from the finished stock is pumped to a Bird Consistency Regulator, being diluted to about ½% consistency. This dilute stock is then sent to the riffler, which removes the heavy dirt, and thence goes to a battery of three Bird screens. The accepted stock from the Bird screens flows to the paper machine. Rejects are sent to a flat tailing screen. Accepted stock from the tailing screen is returned to the system and the rejects are discarded.

Paper Machine

The paper machine is a single cylinder machine erected by Beloit Iron Works. The maximum trim is 155 inches but the usual trim is 144 inches.

The vat is counter-flow but it has a stock circulating system with the overflows at each end. The cylinder is five feet in diameter with a 169 inch face. After being couched, the sheet is carried on the felt to the first press.

The machine originally had three plain presses, but they have just been replaced with a suction first press, plain second press and suction third press. The new presses take up much less space than the original press section, allowing room for additional dryers. Six 75 psi dryers that were removed from the dry end are to be placed in the new space. A total of twelve 75 psi dryers were removed from the dry end and replaced by twelve 150 psi dryers. The other six 75 psi dryers were sent to one of the Eastern Bird Mills. In addition six other 150 psi dryers were added at the dry end. Thus the total change in the dryer section consists of the addition of twelve new 150 psi dryers plus the replacement of six 75 psi dryers with six 150 psi dryers.

In addition, 12 Red Ray burners were added at the wet end. These burners use 14,000 cubic feet of natural gas per day, and have increased production by about 10 tons per day.

There are now 33 dryers all of which are 60 inch diameter with 170 inch face. With an additional six to be added at the wet end.

The single calender stack has five rolls, and the two reels are slatted wooden drum reels equipped with slip belt drives.

The Langston winder is equipped with shear slitters.

Eventually it is expected to increase production to 150 tons per day on this machine.

The machine is equipped with a Ross Hood and hot air system.

The machine is driven by a 250 HP, General Electrical steam turbine through a line shaft and Beloit V-belt sectional drive, together with a General Electric D. C. helper drive on the vat and first suction press.

Power Plant

The original power plant was equipped with a Riley Boiler having a capacity of 35,000 lb. of steam per hour at 250 PSI. Another Riley boiler, identical with the first has just been installed making the total steam production 70,000 lbs. per hour. Both boilers are fired with natural gas.

Warehouse

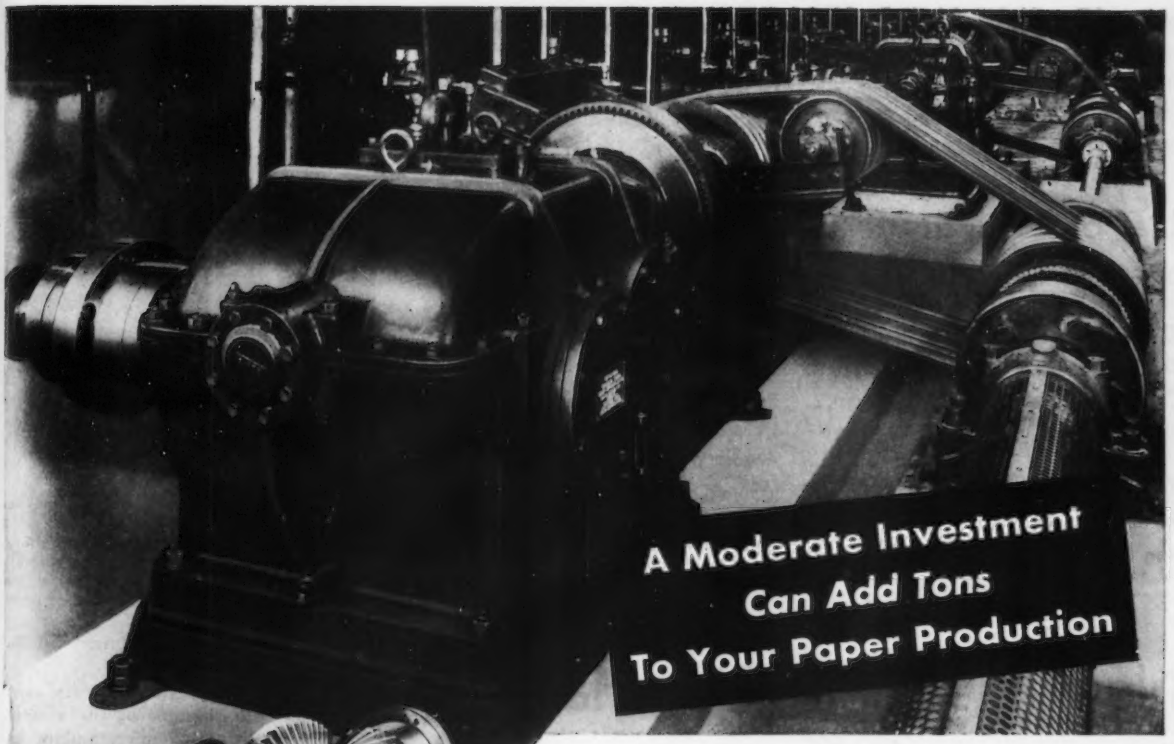
A new warehouse for the storage of finished products has just been completed. This building is 202 feet long, by 80 feet wide, and is 18 feet high to the eaves. It is constructed of corrugated galvanized iron. This building has a capacity of 1800 tons of roll stock.

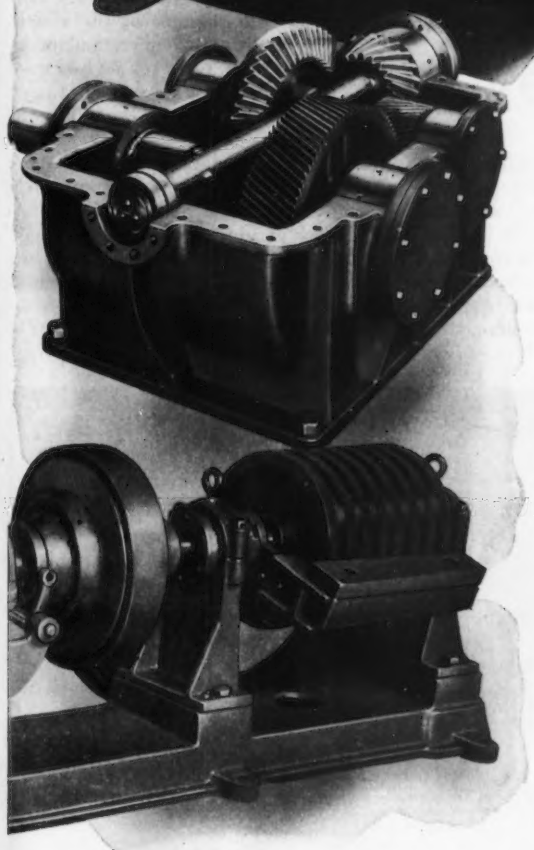
Roofing Plant

The roofing plant takes rolls of stock 48 inches wide from which shingle strips 12 inches wide by 36 inches long are produced. In addition slate roll goods and asphalt felt are produced from felt, 36″, 32″, 38″, 31″, 40″ wide.

The sheet is first saturated with asphalt and run through a hot chamber to obtain greater penetration.

After being saturated with asphalt, the sheet rceives a surface coating of asphalt, into which the first coating of granules is applied. A second coating





The Sandy Hill Selective Drive

All Sandy Hill Selective Drives were installed and started up and are still running without structural or functional failure.

This reflects the attitude of the company's designers in designing adequately for paper machine operating strains. It reflects the Sandy Hill designers' knowledge of paper mill operating conditions which the drives must meet in order to function without failure or annoyance to the user.

Sandy Hill does not build a cheap drive because it believes that a drive which will last over a long period of years with no more attention than adequate inspection and lubrication is the most economical per ton of paper made.

Features

Unvarying draw between sections.

Fineness of draw regulation.

Simplicity of design that keeps maintenance within the ability of the good paper mill millwright.

Power saving and low first cost to a degree hitherto unknown.

No detectable slippage due to the V-belt feature of the drive.

Saving in space, no basement or mezzanine needed for line shaft.

Write on your company letterhead for further information about an adequately designed drive.

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of colored granules is then applied before the sheet is cut into the shingle strips. The strips are counted and packed into bundles by hand, and then carried along by a roller conveyor.

Executives and supervisory personnel responsible for the successful operation of this mill include: L. L. Williams, Manager; B. P. Soward, Supt.; Neill McNeill, Asst. Supt.; R. N. Potter, Chief Chemist.

List of Equipment and Suppliers

Design & Construction, Rust Engineering Co.

Chemi-Pulpers, Pandia Inc.

Defibrators, Pandia Inc.

Chipper, Carthage Machine Works.

Electric Motors, Westinghouse Electric Corp., General Electric Co.

Rag Cutters, Taylor-Stiles Co.

Refiners, Hermann Mfg. Co.

Rag Beaters, Dilts Machine Div., Black-Clawson Co.

Jordans, Noble Wood Mfg. Co.

Consistency Regulator, Bird Machine Co.

Screens, Bird Machine Co.

Paper Machine, Beloit Iron Works, Inc.

Auxiliary Dryers, Red Ray Mfg. Co.

Winner, Langstrom Mfg. Co.

Paper Machine Hood, J. O. Ross Engineering Co.

Boilers, Riley Stoker Co.

Motors and blowers are mounted in a battery. This gives standardization of parts, flexibility of positioning and ease of changing the blower input by varying the number of units.

New Pneumatic Chip Handling Equipment by Conveyair

A new type of unit, designed especially to meet chip handling needs, has been installed at the Harmac mill of MacMillan and Bloedel near Nanaimo. Because of a special feeder for the chips, it has a number of design improvements throughout.

Pneumatic systems for material handling have never been especially well adapted to the handling of chips because of the difficulty in feeding the chips into an air stream.

If a pneumatic system is to operate efficiently, the material must be metered into the system at a constant rate and the air made to carry its maximum amount of material.

The equipment has four main parts: the motor blower units, the feeder, the tubing and discharge outlet, and the control system. A number of blower units can be connected to the same feeding chamber to give the required capacity. Forced feeding to the blowers means that a high density of chips is being moved and that a small diameter tube can be used. This factor alone causes great saving throughout the design because the lighter tube can be more easily suspended from walls, ceilings and building sides. The necessary brackets, being light weight, are less expensive than with the conventional blowers. The smaller motor units make the minimum of construction necessary.

Production has been standardized on a small but highly efficient motor blower unit that is mounted on a cast aluminum base. The blower is of the positive displacement type and is mounted directly on the base. Each blower is equipped with its own oiling system. The motor is mounted on a plate to allow for adjustment of the belt drive.

The number of blower units used will vary with the size of the system. Such versatility through standardization gives the advantages of low manufacturing costs; lightweight units with consequent ease of handling and installation; flexible arrangement of units in compliance with available space; standardization of spare parts, readily obtainable at lower cost than units of varying sizes would provide.

The chips are forced by the feeder into a pressurized air stream, but tests have proven that the action of the feeder does no harm to the chips. The

Blowers feed into a common tube which also contains the outlet of the feeder. The hopper at rear is filled from the bins outside and the special feeder packs the air stream, making it carry the maximum load of chips.

rate at which the chips can be transported is largely determined by the size of the feeder.

The feeder unit can be combined with other equipment because the hopper has been designed with a maximum height of 24 inches and no special building is needed.

Tubing size is very small considering the amount of chips handled by the system through the feeder unit. This means that tubing supports are not expensive and can be hung on the top or sides of buildings, inside or outside. So little space is required that existing equipment does not need to be disturbed.

The chips may be discharged from the tubing directly to storage, or through a separator. They can be discharged in one or several places by the use of a Conveyair 3-way valve. The operation is dust free, simple and versatile.

The installation shown by the accompanying pictures taken at the Harmac pulp mill indicate the application of this system to chip handling. Chips come in 10-unit trailers from B.C. Forest Products' Youbou mill and are dumped into the outside chip bin. A belt or chain conveyor carries them to the hopper which is in the building with the blower units. In this set up there are four blower units each with a 25-hp. motor. These are linked up with one feeder powered by a 30-hp. motor. All this equipment is housed in the one small building beside the larger bin into which the trailers are dumped.

The system must move 40 units of chips per hour. The distance is 125 feet horizontally and 70 feet vertically. It must also handle fir and hemlock chips separately and store them in different silos.

The feeder and blower discharge into a 7¼-inch diameter pipe which is supported by brackets from the sides of the silos. A hole has been made in the side of the gallery sill below the gallery walk on the silos through which the pipe passes. Thus, chips may be blown directly into either of the silos without the use of large cyclones, and without creating dust or interference with any other equipment installations.

It is believed that Potlatch Forests, Inc., Lewistown, Idaho, is adopting this equipment. The installation has a small feeder and only one blower so that the total power requirements will be 25 hp.

The chips will be handled from a box car and taken 200 feet with a rise of 15′ to 20′. With the smaller capacity, a 3⅞″ inside diameter pipe will be used and the volume handled will naturally be less than the Harmac installation.

This equipment appears to offer many economies over previous designs of blower equipment for the handling of chips, and may well be worth watching now that it has been introduced to the industry. It is being manufactured by a firm called Conveyair (Pulp Division) Ltd. in North Vancouver, B. C.

Continue Improvements At Michigan Carton

Michigan Carton Co., Battle Creek, Mich., is continuing the improvement program whose largest phase was completed in 1948 with the start-up of its new and completely modern Angell Street plant at a cost of several million dollars.

Delayed by the steel strike, but getting under way again now, is the complete rebuilding of one of the two Black-Clawson cylinder machines in the older unit of Michigan Carton on East Fountain Street where sales and management headquarters are also located. Part of the improvements at the latter site feature ultra-modern but completely functional facilities for the latter activities. The older offices of the company, themselves completely renovated, have been extended to the river bank with a wing which embraces a large reception foyer, private offices for management and sales personnel, directors' meeting room, and a solarium lounge for customers and other visitors to the plant. The decor of the new office wing is in keeping with a company devoting itself to modern packaging. Cork floors with special design inlaid, blonde-wood walls and furniture, and indirect lighting of latest type, are featured.

In the mill adjacent, changes are being made in the building housing the rebuilt machine and other improvements will go forward from time to time at the East Fountain Street location, an official stated to *Paper Trade Journal* this month. Operations at this site have been under way for over forty-five years, but the Angell Street mill is one of the few new paper and paperboard manufactories built postwar. Its completion practically doubled the output of Michigan Carton which now produces about 115,000 tons annually.

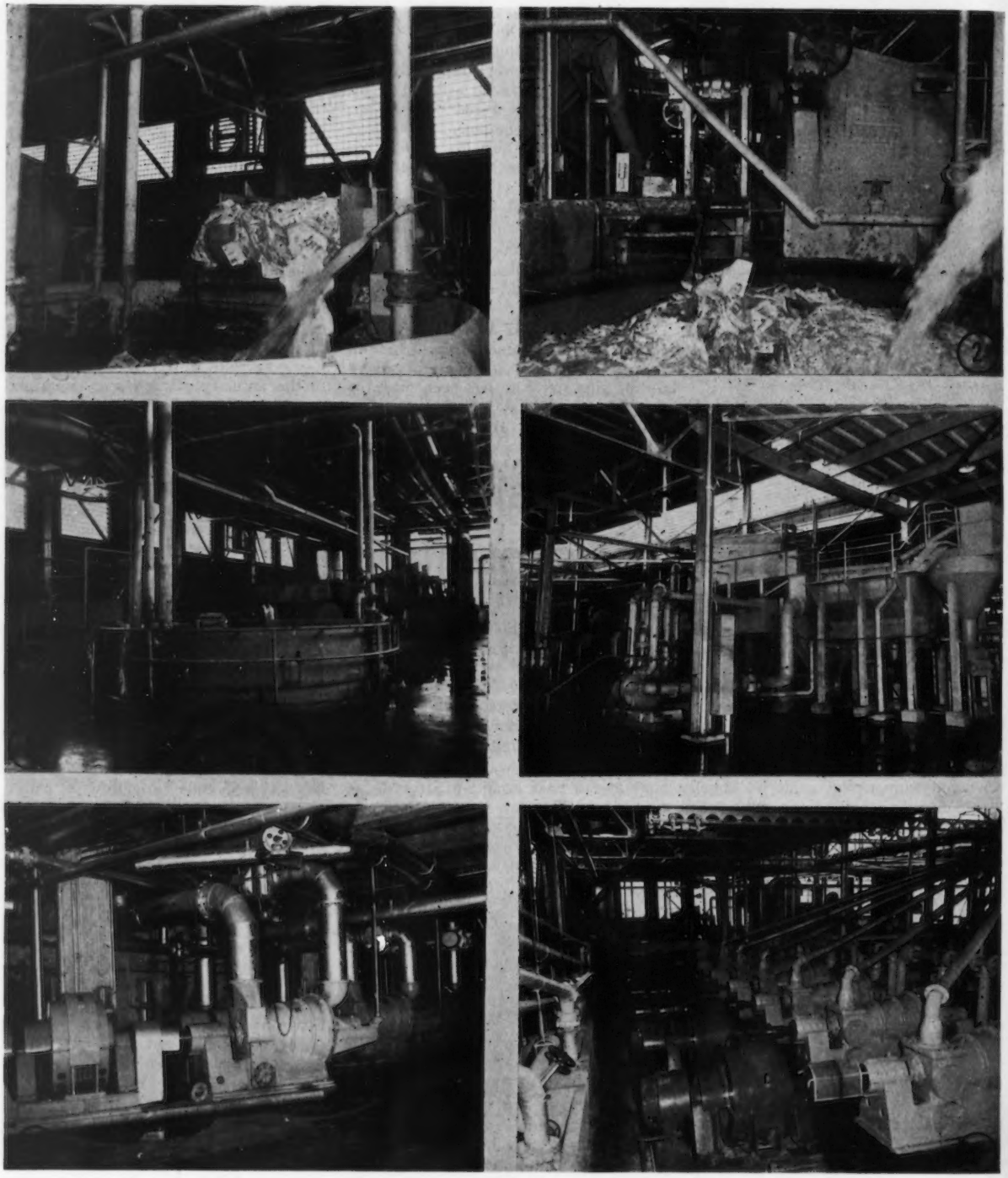
Eighty percent of this production is for the food industries, and about forty percent of the output is used by famous food-producing organizations in or near Battle Creek which of course is widely known in that field. About a third of the output is converted into cartons, the rest sold as paperboard. Some of the latter production goes to large manufacturers of specialty paper products whose items are packaged for the consumer trade.

When the Angell Street mill was being erected, considerable attention was focused on the cylinder paper machine appropriately christened "The Angel." It was and is the longest papermaking machine in the world, measuring 550 feet from wet end to rewinder. Trimming 128 inches, this modern Beloit machine has 87 dryer rolls and a section for coating-on-the-machine under Kimberly-Clark-Mead patents. A conception of its length can be gained by stating the fact that a communication system has been installed between the wet and dry ends of the machine.

Nonetheless, this machine, remarkable as it is in the industry, is but an integrated part of an unusually modern paperboard mill whose management has devoted equal attention to materials handling, stock preparation, and general over-all phases of carton manufacturing and working conditions.

Production begins in two sets of warehouses, one of which is confined to waste paper storage, the other to woodpulp storage. Both are of such size not only to permit suitable inventories for the immense production at Michigan Carton, but also to take advantage of market periods in waste paper and pulp and keep such stocks under cover for eventual use. Handling of the raw stock is by Clark Tructractors to three large especially-built belt conveyors which transport it to the upper mill level and specifically to the three Hydrapulpers which measure 14 feet, 16 feet, and 20 feet respectively. These are direct-driven by Westinghouse motors at the bottom end in the basement level. Three thousand to 4000 pound batches are the general rule for the Hydrapulper mixes. The 14-foot pulper is used for both continuous and batch pulping, while the 16-footer is generally em-

Figure 1—Conveyor from Stock Warehouse Carries Waste Paper or Pulp to One of Three Hydrapulpers. Figure 2—Close-up of Recently Filled Hydrapulper Showing (at Center) Drag-Line for Separating Wires, Rags and Other Debris from Stock. Figure 3—There are Three Hydrapulpers: 20-Feet, 16-Feet and 14-Feet Respectively. Figure 4—The Shartle Bros. Cleaning System. Figure 5—Three Shartle Hydrafiners Installed in Basement. Figure 6—Battery of Six Shartle Jordans. The Stock Lines Are Leading Down from the Refiner Head-Box.



ployed as strictly batch pulping equipment. The latter runs alternate batches of top liner and under-liner. The smallest Hydrapulper takes back liner stock, the largest is devoted to filler stock.

The man in charge at the warehouse end of the conveying is familiar with the warehouse stocks and has in hand data on the specific order so that he may intelligently send stock via the conveyors to the Hydrapulpers.

The flow of stock from the 14- and 16-foot pulpers are more or less identical. The stock passes from Hydrapulper to the cycling chests hooked up to Shartle Hydrafiners from which it goes to storage chests. The next step is the head box for the Shartle jordans installed in a battery of six. This head box is all stainless steel and mounted near the roof on steel superstructure.

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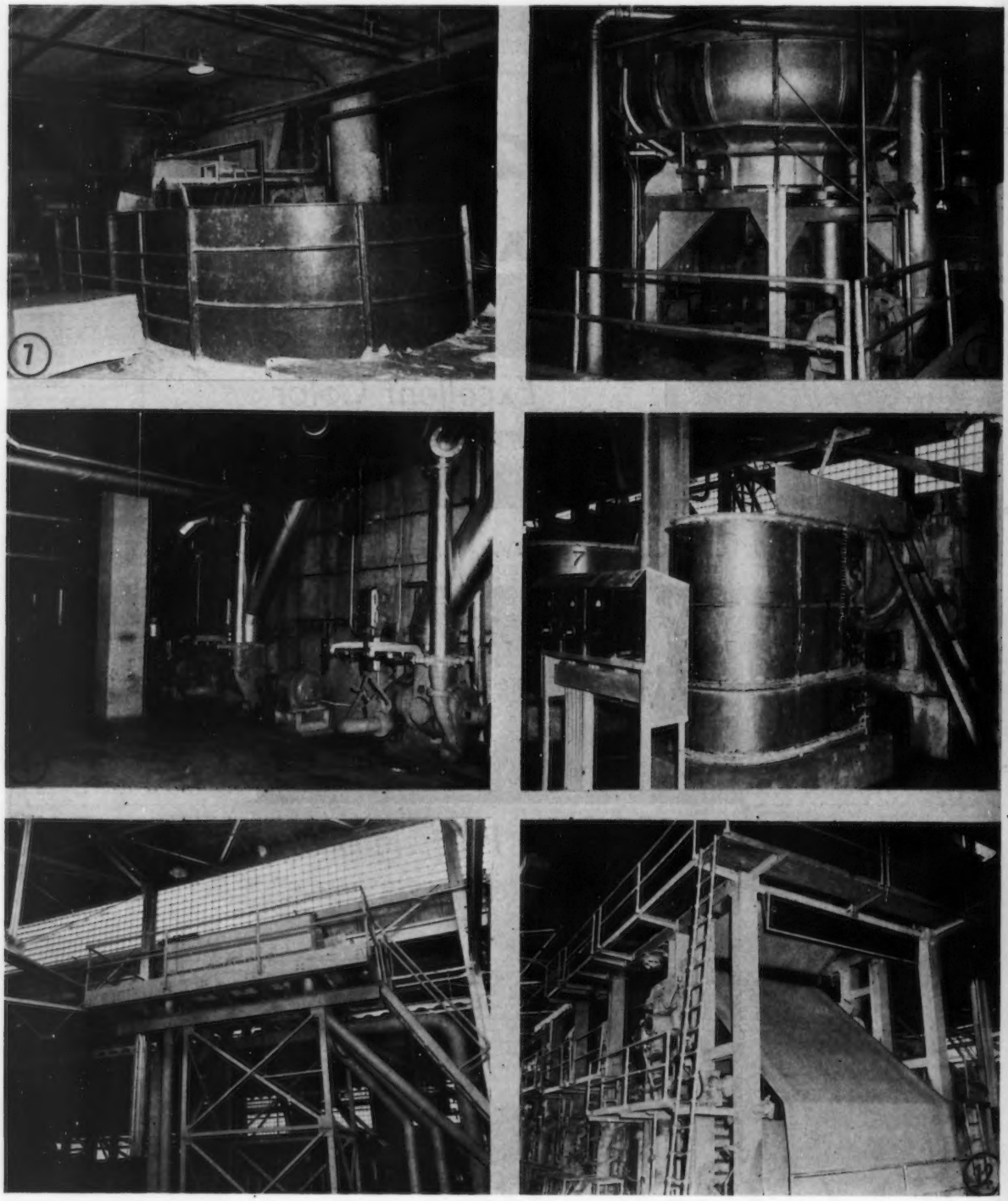
Figure 7—The Noble & Wood Broke Beater, Only Beater in the Mill, Is Installed in the Basement. Figure 8—Power End of the 20-Foot Hydrapulper. Figure 9—Four Shartle Stock Pumps. Figure 10—One of Eight Bird Screens Ahead of Machine; All the Mixing Boxes Are of Stainless Steel. Figure 11—The Shartle All-Stainless Head Box Installed Atop a Superstructure Above the Battery of Jordans. Figure 12—Wet End of "The Angel" the Beloit Cylinder Machine Believed to Be Longest in the World, 550-Feet.

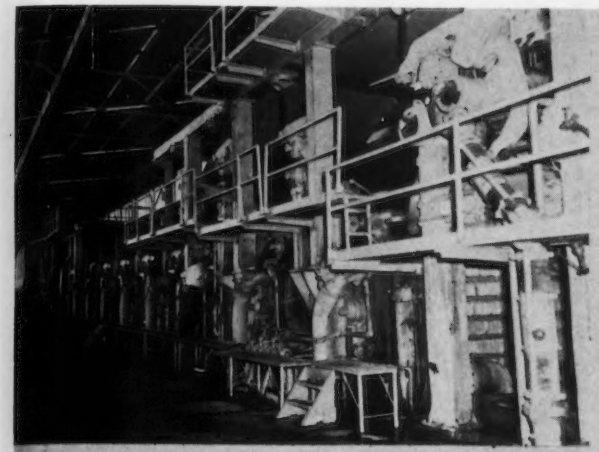


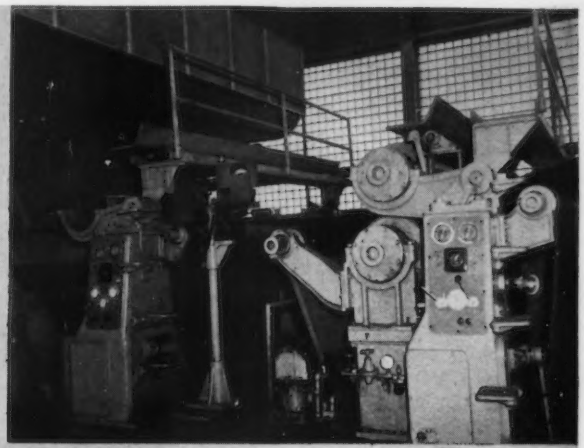
The stock is then pumped to the jordans, reaching the machine head box via the machine chests. From the head box the stock passes through Bird screens to the machine vats.

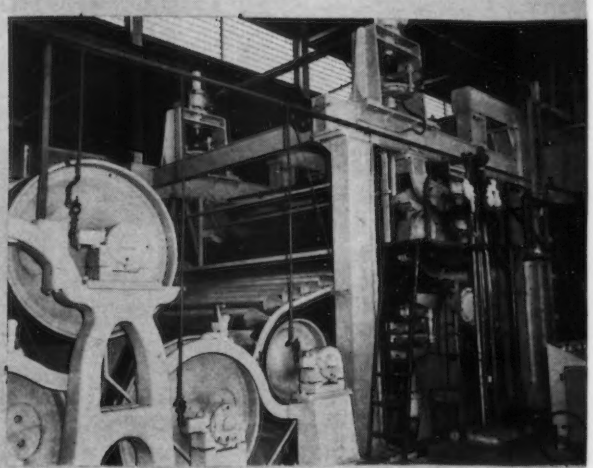
Filler stock from the 20-foot Hydrapulper is treated in a Shartle grit remover and then passes to the thickeners, circulating white water being a medium in both operations. From the thickeners the stock goes to storage chest and thence to the jordan head box and jordans. Recycling is possible between the latter two. The remaining steps to the machine are thereafter the same as entailed for the 14- and 16-foot Hydrapulpers.

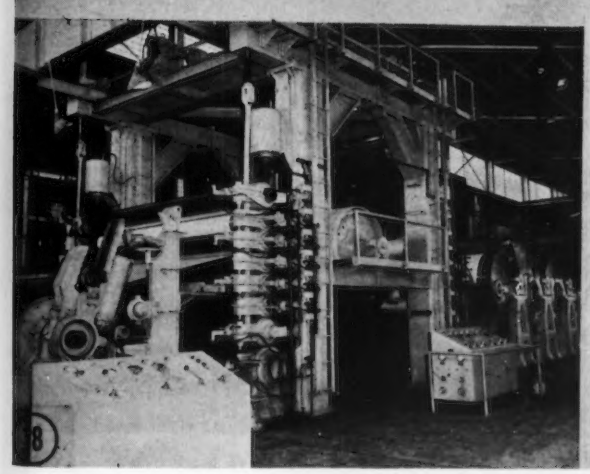
That in brief is the flow of produc-

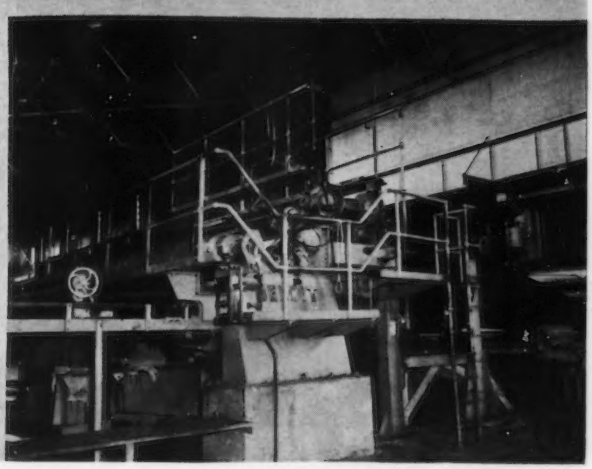
Figure 13—Further Along the Wet End of the World's Longest Cylinder. Figure 14—Third Press Section of "The Angel." The Hood Is a Ross Type. Figure 15—There Are 105 Dryer Rolls in This Dryer Section. Figure 17—A View of the Coating Section on the Machine. Figure 18—Two Views Showing the Finishing Stack, Breaker Stack and Regular Stack on the Machine. Figure 19—Double-Knife Cutter and the Start of the Maxim Layboy.







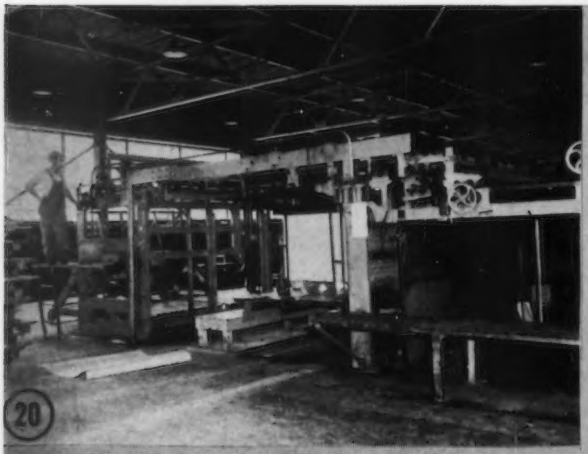


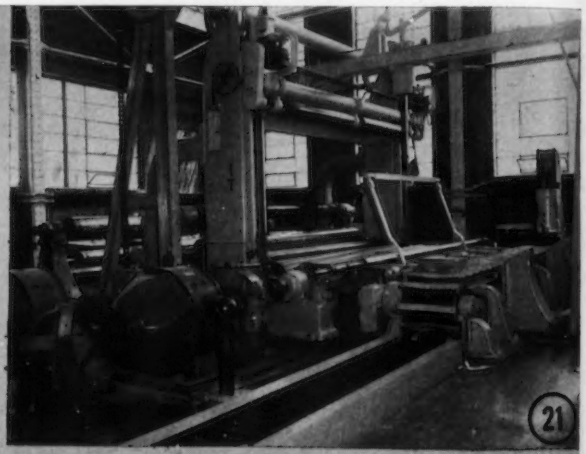


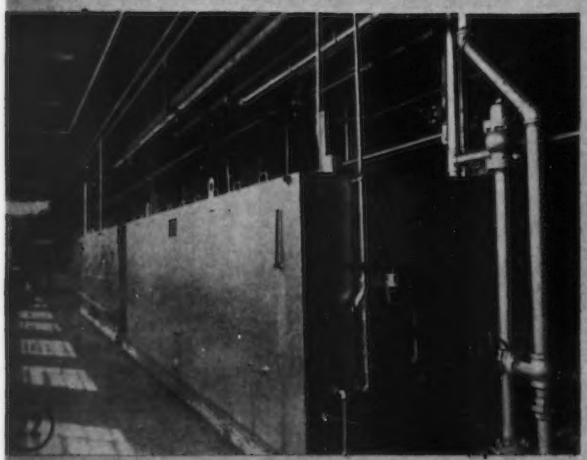
tion to the machine, but a word or two about some special features of the mill and layout are in order to augment the photographs with this text.

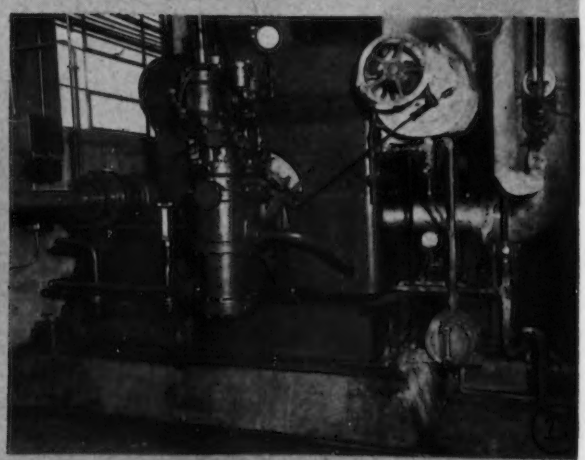
The mill buildings are of steel and brick construction with liberal use of glass blocks for unusually fine natural lighting. The machine room roof is of concrete slab and steel-truss construction. The use of open space both in the basement and on the main level has been liberal, and obviously the method of housekeeping on Angell Street does not allow the open areas to become cluttered. Some of this open area has been designed for possible future expansion, but primarily it has been in-

Figure 20—End of Layboy. Figure 21—Beloit Rewinder. Figure 22—Bowser Oil Pressure Lubricating System in Basement. Figure 23—Westinghouse Steam Turbine Which Powers the Machine. Figure 24—Shipping Dock. Figure 25—Storage Chests of Slab Concrete.





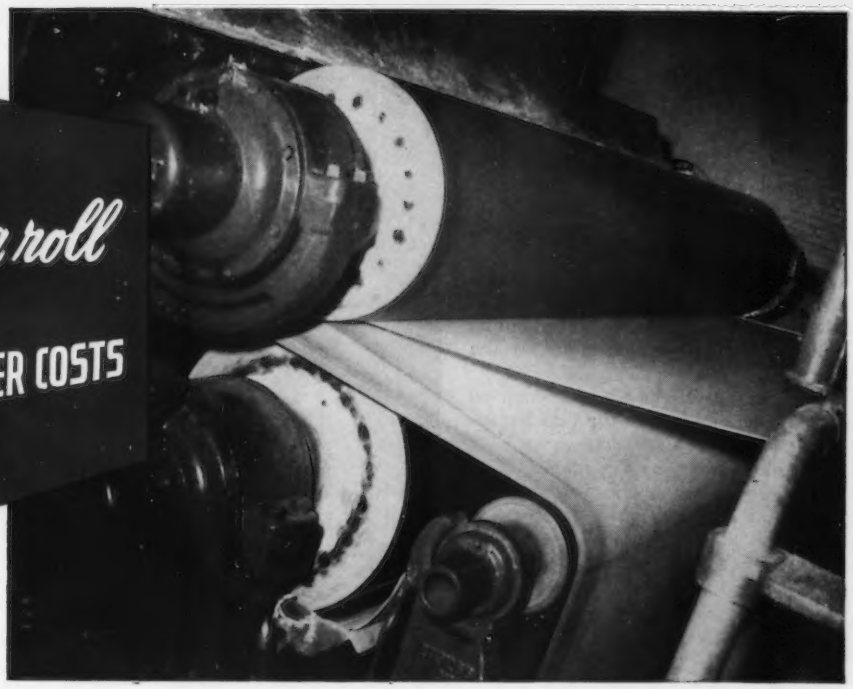




corporated for purposes involving safety, lighting, materials handling, and machine and equipment maintenance. The housekeeping in Michigan Carton's new plant is in keeping with the traditions of the food industries it largely serves.

The sense of airy roominess with solid and well-lighted construction obtains as well in the offices of the superintendent, tour bosses, and other operating personnel, as well as in the rest rooms and locker rooms of the mill. The area in front of the plant is more than ample not only for the parking of employes' cars but also for the maneuvering of the extra large trucks and trailers by which a part of the products are shipped to customers. The shipping dock on the rail siding, under cover, shows the same understanding

Picture of a roll Cutting PAPER COSTS



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need of space in modern paperboard production.

Major equipment installed on the lower level of the plant include the Hydrafiners and of course the bottom projections and motor installations of the Hydrapulpers. The Bowser automatic lubricating unit is installed here. So is the Westinghouse 1250 hp. turbine working at 450 pounds of steam pressure and hooked to what must be one of the longest paper mill drive shafts in the world. Power is transmitted from this shaft by individual belts to the machine sections on the main level.

Also installed in a closed section on the basement level are the two Sveen-Pederson savealls. On the same level are tanks and mixing equipment both for coating and for chemical contents of some types of paperboard produced here. Also located in the basement is the heart equipment for the Ross-Grewin blower system which is a feature. Machine hood and auxiliaries are also by Ross. The Noble and Wood broke beater, only beater in the mill, is also on the lower level.

On the main plant level, as indicated heretofore, are the main features of the pulp preparation with the head boxes elevated. The over-all plant layout on this level is roughly in the form of an "H" with the cross-bar acting as the machine room and the pulp preparation and finishing facilities in the broader areas at each end.

The machine known as "The Angel" is housed in a long building of attractive appearance and thoroughly functional design. In the design of this machine, one of the outstanding cylinder machines to be built since the war, Beloit engineers worked very closely with the engineering and management staff of the Michigan Carton Company to meet specific mill needs for ease of control and dependable operation. The eight cylinder moulds, 60″ in diameter, have 140″ face. Each of the eight cylinder moulds and eight couch rolls is mounted on Timken roller bearings.

The design of the machine called for several plain presses and a total of five suction rolls, including a suction drum press with suction side roll, a suction primary press, a suction first press and a suction reverse press. All suction rolls were built by Beloit Iron Works.

Other design features included precalender and coating unit, Beloit open-side calender stacks with air-loading, Beloit cutter and Beloit hypoid gear units. S.K.F. bearings were used on turning rolls, wringer rolls, suction rolls, press rolls, dryers and calender rolls. Electric motor drive was provided for the cylinder moulds, the side suction roll on the suction drum press,

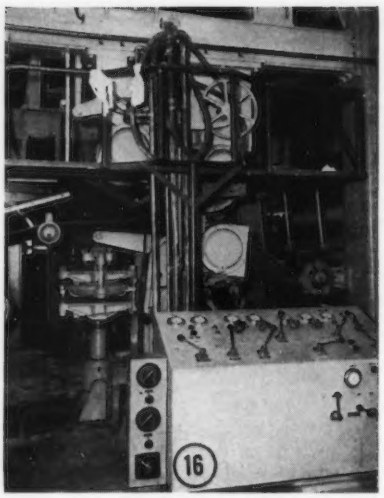


Figure 16—The Panel for Air-Control of the Machine.

top and bottom rolls of the suction primary press, wringer rolls, top and bottom first press rolls and plain primary press roll. For the remaining sections on the machine, hypoid gear units, driven by belts from the roller bearing mounted lineshaft, were supplied. Beloit patented air clutches were used for smooth engagement of each section and air brakes in drive units for the dryer section provide for quick stopping when desired. At the dry end, provision was made for convenient take-up of slack and automatic return to the previous draw adjustment.

At the finishing end is a double-knife cutter hooking into a Maxim-type layboy designed into the machine by Beloit and Michigan Carton engineers. Here again, at the finishing end, the visitor observes the same attention to open area for safety measures, maintenance operations, as well as handling of the finished product.

The Angell mill makes its own power, and in that connection both its power plant and water supply facilities are of interest. The latter includes complete pumping station at the Kalamazoo River, chlorinating equipment, auxiliaries for pumping beneath the street level to the sand filtration system at the plant site. There is a 100,000 gallon water tank to furnish head for the system, and a complete water softening system.

The power plant features a 2000 kw Elliot turbine and area for another turbine installation should one be required in the future. There is an Ingersoll-Rand air compressor, necessary for the hydraulic features of the paper-making machine.

The boiler room carries two rotating-grate furnaces with area marked out for a third when required. Graded coal hopper is overhead. There are two Springfield boilers of 60,000 pound per hour steam capacity.

Plainly, Michigan Carton is set for a long pull on modern carton manufacturing in its Angell Street mill. And that plant is so advanced it seems reasonable to conjecture that the steady improvements which are proceeding over the years at its other Battle Creek unit will follow insofar as practicable the program completed in one project on Angell Street.

Sonoco Buys Gates Paper

Sonoco Products Co., Hartsville, S. C., has acquired the Gates Paper Co., Los Angeles. E. H. Southwell, former president of Gates, will remain as Sonoco's manager for the West Coast plant and will also have charge of sales for the Western Division.

Gates Paper Co., established in 1928, produces spiral paper tubes, paper cans, fiber cans with metal ends, containers and other paper products for the packing industry and paper specialties. Under Sonoco's management all these products will continue to be manufactured and in addition parallel and convolute tubes will also be produced. Later new equipment will be installed to manufacture the same type of products presently being produced in Sonoco's other plants. These include fiber forms for concrete piers and columns, fiber duct used in warm air heating installations, paper carriers for the textile industry and other paper specialties.

India's First Newsprint Mill to Start Production in 1953

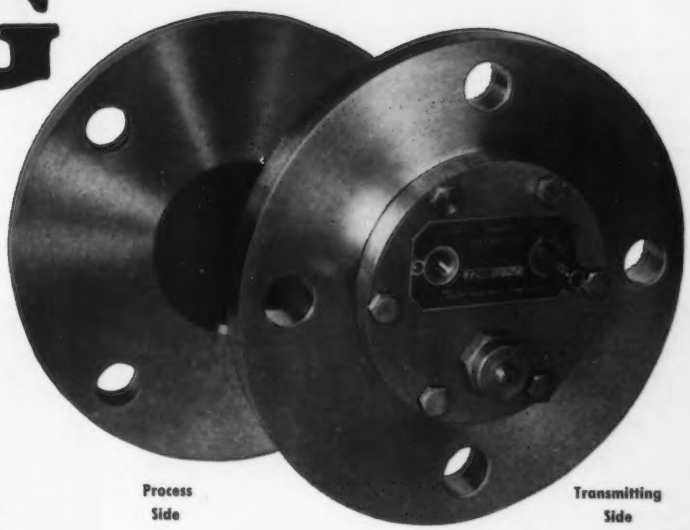
Messrs. Gardner and Harwick of the Ebasco Services, New York, who inspected the NEPA Mills, India's first newsprint mills at Chandni in Madhya Pradesh state, believe that the project will be "a substantial addition to the economy of India," producing newsprint from the middle of 1953.

This five crore project is well under way and erection of equipment will be shortly completed—the delay is partly due to the fact that more equipment is still to arrive from the United States.

While the mills will produce mechanical pulp, manufacture of newsprint will actually start in the middle of 1953 with imported sulphate chemical pulp.

It is expected that an American engineer will train Indian personnel in newsprint manufacture.

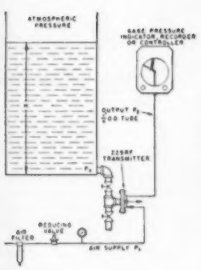
DOESN'T CORRODE or CLOG



Process Side

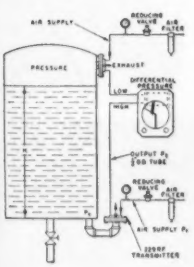
Transmitting Side

APPLICATIONS



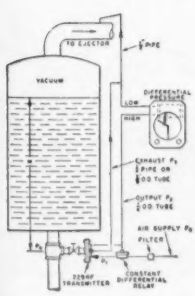
1

For Open Tanks. A typical Taylor 229R Transmitter installation on an open tank as used in **BLEACH TOWER, BLACK LIQUOR, SMELT DISSOLVING, PULP STORAGE, HEAD-BOXES, SIZE TUBS,** and stock lines, or for pressure measurement in pipe lines.



2

For Closed Tanks Under Pressure. Here transmitters are installed at both bottom and top of the tank and the differential pressure is measured by a mercury or aneroid manometer. Typical uses — **ACCUMULATORS, ABSORPTION TOWERS.**



3

For Closed Tanks Under Vacuum. For example, **DEAERATORS, VACUUM RECEIVERS.**

TAYLOR LIQUID LEVEL TRANSMITTER

Want to measure accurately the level of liquids that are corrosive or viscous—or contain solids? The Taylor 229R Liquid Level Transmitter is a force-balance unit specifically designed to measure pressure and liquid level of viscous or corrosive liquids and liquids containing solids. No levers or cams, so no frictional error. It's adaptable to open as well as closed tanks, under pressure or vacuum, and can be attached to the bottom or side of the tank to give accurate level measurement. Output can be connected with an indicator, recorder or controller as much as 1,000 ft. away from transmitter.

This is another example of how Taylor instrumentation can help you cut costs and protect product quality in almost every phase of paper manufacture. Ask your Taylor Field Engineer or write for **Bulletin 98069.** Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada.

TAYLOR INSTRUMENTS MEAN ACCURACY FIRST

Fitchburg Improvements

In December, 1864, Rodney Wallace, Stephen Shipley, and Benjamin Snow purchased the existing Lyon Paper Mill at Fitchburg, Mass., and began operating as the West Fitchburg Paper Co. Five years later, Wallace bought out his two partners and became the sole owner. At that time the production was 2½ tons per day. Within the next ten years two other small mills located in the same vicinity were purchased, thereby increasing the production to six tons per day. By 1880, new equipment and improvements had increased the total production of the three mills to 15 tons per day. At that time each mill had one Fourdrinier. The sizes were as follows: No. 1, 68 inches; No. 2, 72 inches; and No. 3, 85 inches. Grades were glazing and coating base, greeting card, hanging, fancy wrappings.

At the turn of the century a fourth mill had been acquired with a 76 inch Fourdrinier being added to those listed above. Production on all machines had been increased so that the total was now 30 tons per day.

In 1905, the 68 inch Fourdrinier was replaced with a new machine 90 inches wide, and production was increased to 40 tons per day.

In 1911, another 90 inch machine and a new 110 inch machine was added and in 1912 a third 90 inch Fourdrinier was installed. In 1914, the 72 inch Fourdrinier was removed. Production at that time was 70 tons per day.

Improvements of equipment and increased machine speeds allowed a gradual increase of production up to 100 tons per day in 1921, at which time a new 156 inch Fourdrinier was added. This is the present number 7 machine and is the last paper machine addition to the mill. Production increased at this time to 125 tons per day.

In 1932, the 76 inch and 85 inch Fourdriniers were shut down and later removed. Production dropped to 100 tons per day and remained between 100 and 110 tons per day, until number 7 machine was rebuilt in 1950 when production increased to the present 175 tons per day.

Fitchburg does not have a pulp mill, that is, not a wood pulp mill. However, it does have one of the most modern de-inking plants now in operation.

This plant was originally built in 1947 to process 60 tons per day of waste paper. In the fall of 1951 the plant was expanded to handle a maximum of 130 tons per day of waste paper for a yield of 100 tons of fiber and at the same time a new bleaching plant was installed. The present yield of clean bleached fiber is about 70 tons per day from 100 to 105 tons of waste paper. The actual de-inking

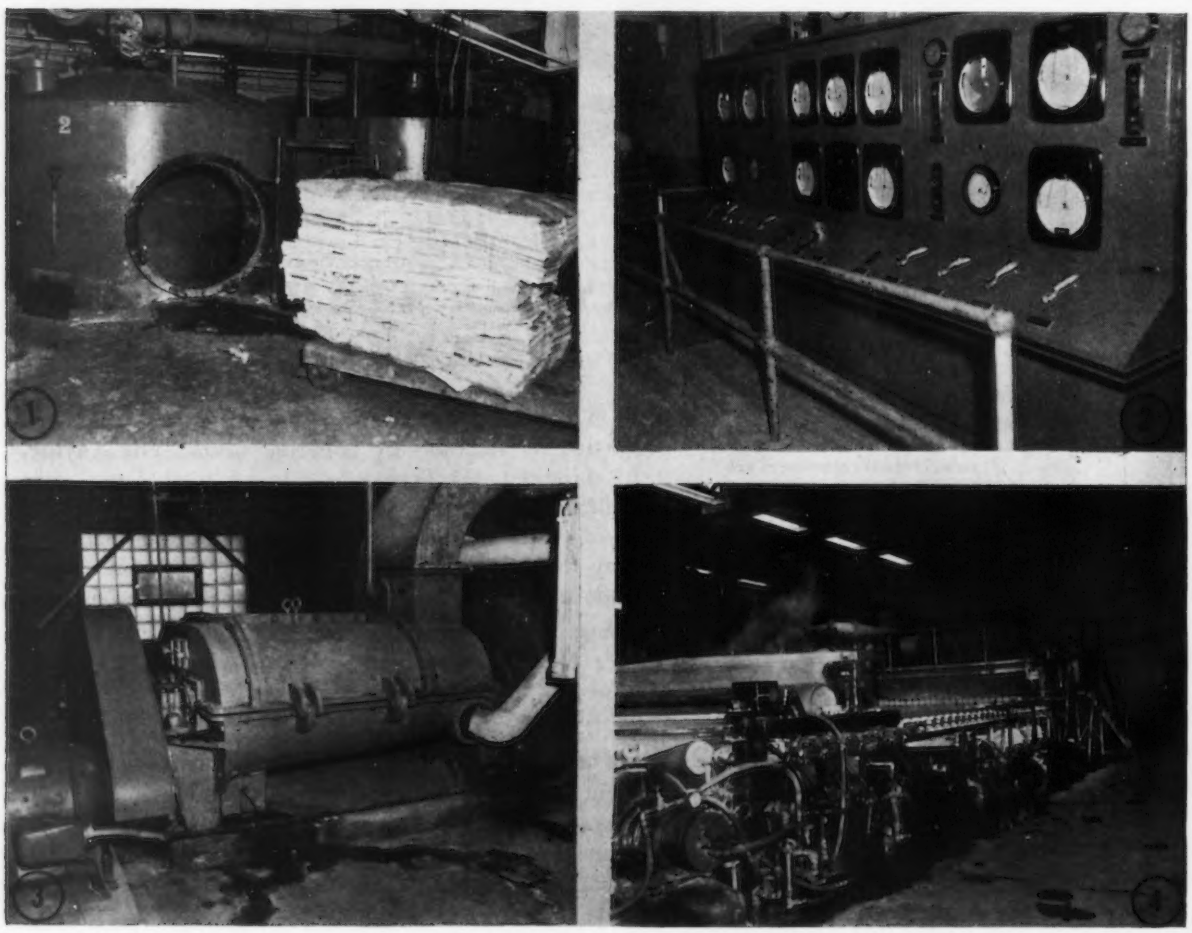


Figure 1—Fitchburg's Pressure Hydrapulpers. Figure 2—Control Panel for Hydrapulpers and Waste Paper Cooking Process. Figure 3—Impco Double Shaft Bleach Mixer. Figure 4—Fitchburg's No. 7 Recently Rebuilt with a New Beloit Wet End.

operation is done in three enclosed Hydrapulpers, each 10 ft. in diameter. Two of these are nickel clad, the third is cast iron. These enclosed Hydrapulpers are built to withstand cooking pressures up to 15 p.s.i.

The plant is operated as a combination batch and continuous system. All operations, except cooking in the Hydrapulpers, are continuous.

Operation of the Hydrapulpers consists of loading them with printed waste such as book, magazine and ledger stock with water to provide consistencies which are varied according to the type of stock and the difficulty of cleaning it. After the batch is closed, measured amounts of caustic soda solution are added through a meter. Steam is then added until the required temperature is reached. All operations except loading of the waste paper and closing the hatch are controlled from the instrument panel. Recorders on this panel show cooking time and temperature and amount of caustic added. Liquid level recorders provide a record of the amount of water added as well as total amount of stock.

Dilution of the caustic soda from the concentration of 50 percent or 73 percent, as delivered at the mill, to the concentration of 20 to 25 percent, as used, is also controlled automatically.

Brown stock from the Hydrapulpers is dropped into a large brown stock chest from which it is pumped out continuously. The first units in this continuous system are two pin traps where the stock is diluted to about one percent consistency which allows pins, and other heavy, metal or non-metal, materials to settle out. The stock is then pumped through a paid of ten inch low pressure vortraps where more of the heavy dirt is removed.

Next in line is a pair of Jonsson screens that remove coarse, lightweight dirt and undefibered pieces of stock. A battery of ten three-inch Dirtecs removes the fine heavy dirt before the stock goes to a group of four Bird fine screens which completes the dirt removal process before the stock is washed.

The washing system consists of three parallel sets of counter-current, three-stage, decker type washers. This equipment was built by Process Equipment Div. of Rodney Hunt Machine Co., Orange, Mass. These units are built of stainless steel with cylinders four feet in diameter by 8½ feet long. Each cylinder is individually driven by a 7½ hp. U. S. Varidrive motor.

The washed stock at 12 percent consistency is carried by screw conveyors to a small surge chest from where it is pumped up to the bleaching tower.

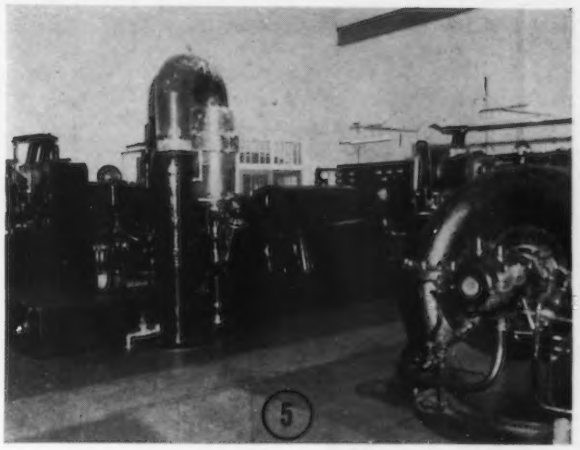


Figure 5—Turbine Room Containing Westinghouse and General Electric Turbines.

At the top of the bleaching tower, the stock flows into an Impco double shaft mixer, where it is thoroughly blended with the bleach liquor and steam.

Sodium hypochlorite is the only bleaching agent used and it is made in the mill from liquid caustic soda and liquid chlorine. This mill was probably the first in the U. S. to use sodium hypochlorite for bleaching de-inked stock, having first used it in 1930.

Additions of both steam and bleach liquor to the stock are automatic, the rate of bleach liquor addition being volumetric with the steam flow rate being thermostatically controlled to maintain uniform stock temperature.

The mixture of stock and bleach liquor at about 11 percent consistency drops into the tile bleach tower which is 14 ft. in diameter by 50 ft. high, and holds about 20 tons of fiber (dry basis) at 12 percent consistency. The stock moves downward slowly without further mixing until it reaches the cone bottom where it is diluted to three percent consistency and pumped to an Impco vacuum washer equipped with a stainless steel cylinder 8 ft. diameter by 12 ft. long.

The washed bleached stock goes through a DeZurick consistency regulator which adjusts it to 4½ percent, followed by an Impco stock meter that measures the rate of flow. The stock then flows into the bleached stock storage chest where it is ready for use on the paper machines.

Paper Mills

In addition to the three paper machines in the main mill there are two 90 inch machines in separate mills a few hundred yards down the river. Each of these machines has two beaters and two refiners for stock preparation.

In the main mill containing machines 5, 6 and 7, the beaters have been replaced by Hydrapulpers. There is a total of four of these machines, all 12 ft. units.

Stock preparation equipment recently added in this mill includes three Jones Jordans and four Jones Fibremasters.

Number 7 machine, which is a Beloit 160 inch Fourdrinier trimming 145 inches, has recently been rebuilt. It has a new Beloit Fourdrinier part and 6 new Sandy Hill suction boxes. It also has a new dual press having one suction and one plain roll and a new size press.

Number 7 machine had the first free wheeling expander roll built by the Mt. Hope Machine Co. It was installed on this machine in 1947 and is still in operation.

Finishing Department

Approximately 60 percent of the production of this mill is shipped out in sheet form. The three large cutter layboys have a combined capacity of 100 tons per day. Two of these machines are Hamblet and the third is a Moore and White. From one to ten rolls may be cut together and the maximum sheet width is 100 inches.

This department is also equipped with two Seybold and one Dayton trimmers. Maximum sheet width for the trimmers is 95 inches, the department also has one supercalender which is seldom used, since the grades made here do not usually require supercalendering.

Converting Plant

The converting division, Decotone Products, is an important part of the Fitchburg Paper Company. Many kinds of printed and surface colored specialty papers for use as fancy wrappers, box covers and cover paper, are manufac-

tured in this division. The plant is in a separate location, a few miles from the paper mills on the road to Fitchburg.

Most of the printing consists of overall fancy designs in one to four colors, printed by the Aniline or Gravure processes.

Power Plant

Steam and electric power requirements of the mill are produced in the mill power plant. Two coal or oil fired boilers, a Bigelow-Hornsby and a Bigelow-Connelly produce 70,000 and 80,000 lbs. of steam per hour respectively, making a total of 150,000 lbs. per hour at 250 p.s.i. 550°F. Electric power is generated by three turbo-generators, all taking steam at 250 p.s.i. 550°F.

There are three turbo-generators, producing a total of 3,150 kw, consisting of a 750 kw unit (a Westinghouse with a condensing turbine), a 900 kw G.E. condensing unit with extraction at 15 p.s.i., and a 1500 watt pressure turbine that exhausts at 25 p.s.i.

The 15 p.s.i. steam is required for number two paper machine dryers; all other paper machines use 25 p.s.i. back pressure steam from number three turbine.

Management

Management and executive personnel at this mill include: George R. Wallace, president and treasurer; D. D. Uong, vice-president in charge of research; John W. O'Connor, vice-president in charge of sales; Carl M. Fellows, vice-president; George R. Wallace, 3rd, vice-president and assistant treasurer; Donald J. Hurley, vice-president and clerk; James Fish, mill manager; G. F. Parks, assistant mill manager; Ernest Eyles, general superintendent; R. H. Doughty, technical superintendent.

Australian and New Zealand Notes

During the month of April last (the latest complete figures available), newsprint imports into Australia totalled 15,755 tons valued at £1,545,-094, a decrease of three tons on those of March. Imports of printing papers totalled 7,537 tons valued at £1,067,606, an increase of 3,305 tons.

Newsprint Supplies Pty. Ltd., the newsprint buying organization which was set up in 1950 by a body of Australian newspaper publishers, states that import restrictions and their effect on newsprint supplies have created "almost insoluble" difficulties, and have made it practically impossible to carry on with certain group purchasing arrangements.

* * * *

A sulphur conservation scheme is now under operation in Australia, and State Governments and sulphuric acid manufacturers have accepted the recommendations of a special committee set up by the Federal Government. This committee has been formed to ensure the essential use of limited sulphur supplies from America, and to advise the Government on increasing sulphur production in Australia. (Australia depends mainly upon America for its sulphur supplies which cost about four million dollars a year).

* * * *

British Cellophane Ltd. has applied for an Australian patent for a method of manufacture of artificial resins in which process resin is heated with a polyhydric alcohol to a temperature or temperatures comprised within the range of 150 and 200 deg. C. for a period between 30 minutes and two hours to form a resinous body, the resinous body then formed being heated to a temperature of between 200 and 300 deg. C. for between two and 10 hours with a saturated dibasic aliphatic carboxylic acid having a molecular weight comprised within the range between 104 and 234 inclusive.

* * * *

The Department of Commerce and Agriculture advises fruit growers that while fruit wrapping paper is subject to import restrictions, sympathetic consideration is being given to the importation of materials necessary for the Australian export trade. It adds, however, that there will be no such imports from dollar sources.

* * * *

Australian Paper Manufacturers Ltd. has commenced production at its Fairfield (Victoria) cardboard mill, and an annual production of from 15,-000 to 20,000 tons of board with a glazed surface suitable for good quality printing is planned. Previously, all cardboard of this type of even thickness has had to be imported.

Registered recently: The Cutner Paper Co. Pty. Ltd., capital £10,000, manufacturers of paper and paper articles; office c/o McElhone and Co., 44 Martin Place, Sydney . . . Broons and Sons Pty. Ltd., manufacturers of cardboard boxes; factory Geelong Road, Brooklyn, Victoria.

* * * *

"Newspaper News" (Sydney) recently published a feature article on the "tragic story of the repression of the comparatively newly-established newsprint industry at Boyer, in Tasmania," stating that "it comprises a sorry record of discrimination backed by parliamentary legislation." The publication says: "Stark fact is that owing to official miscalculation and to government unwillingness to institute rigid restrictions on the sale of power three or four years ago, as was done in New South Wales and Victoria, nearly £3,500,000 worth of plant, which should be working at top pressure to produce Australian white gold—newsprint—is lying idle. The Tasmanian Government should take some definite and immediate action to stop this loss."

* * * *

C. K. Pengilly, the chief engineer of Australian Newsprint Mills, Boyer, Tasmania, is visiting Canada, the Pacific North-West of the United States, and British Columbia. His object is to bring his company up to date in the latest practices and trends in the preparation of wood for pulping, and with developments in the newsprint industry generally.

* * * *

The Tasman Pulp and Paper Co. Ltd. has been officially registered with a nominal capital of £6 million, and it is expected that a public offer of 2,-300,000 £1 shares will later be made. The New Zealand Government will take £1 million of shares, constructional engineers Fletcher Holdings Ltd., £1 million, and customers and associates, £1 million. Operations are expected to be started in 1953, and annual production aimed at is 60,000 tons of newsprint and 40,000 tons of kraft pulp.

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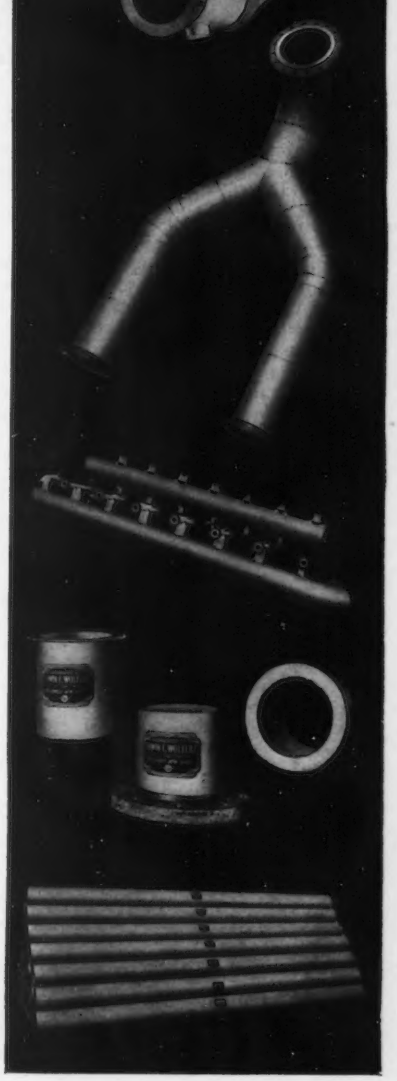
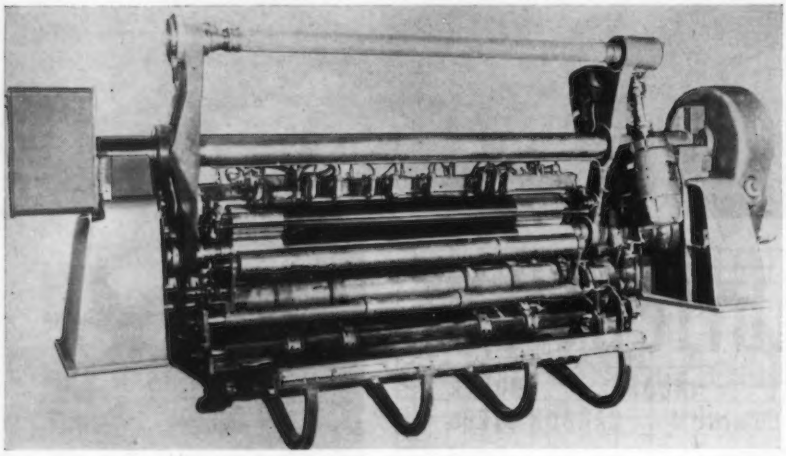


EQUIPMENT AND SUPPLIES



Plastic Winder

The new continuous automatic winder is specially suited to winding of web materials which must be wound with extremely low tension values, materials such as plastic film and sheeting as produced continuously from calenders, extruders and coating equipment.

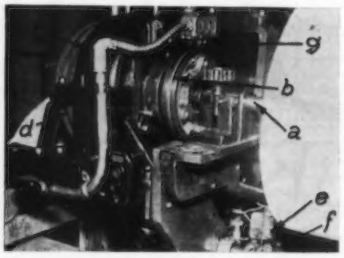
Produced as the result of more than a year's trial on commercial scale experimental equipment utilizing films and sheeting of most calipers and formulations, the winder consists of a rotatable, center wind, two-arm reel, with separate motors driving the winding core or shell through ball bearing spindles. Separate driving motors are of the DC variable-voltage type and are furnished with the winder as an integral part of the complete unit. Winder drive is suitable for addition to any existing take-off and does not require an alteration of the basic calender or take-off drive previously installed, it is stated. Degree of tension and winding operation is controlled by means of speed adjustment of the winding core. Winding is done on cores or shells of 3″ to 9″ in diameter, and two diameters may be used alternately by means of a remote control selector switch. The same basic Model 40 reel is used for the winding of both film and sheeting.

In the Model 40, slitters are incorporated in the winder close to the roll being wound. With the slitters in this position, very straight edges are maintained and it is possible to slit into several widths, the manufacturer claims.

Tension is said to be constant, positive, and automatic, and to require no attention from the operator once the desired tension is set. Even and uniform starts are made and require no adhesive or special processing of core or shell, it is said. The flying-start mechanism changes from a fully-wound roll to a new core or shell automatically without slowing down the process.

Range of duty legend for Model 40 is: maximum roll diameter 24″; maximum web or ribbon width 84″; maximum roll weight 1000 pounds; maximum speed 510 f.p.m.; total web tension range 2 to 60 pounds.

Write to Dilts Machine Works, Fulton, N. Y. for bulletins DK-28 and DK-29.



Automatic Tension Control

a.—Web Shaft; b.—Collector Ring; c.—Oil Immersed Magnetic Clutch; d.—Drive from Parent Machine; e.—Dancer Roll Limit Switch; f.—Dancer Roll Fulcrum; g.—Collector Brushes.

The new automatic tension control system embodies constant speed and constant tension control on web or filament winds or unwinds. The device can be used, the manufacturer states, as an attachment in conjunction with any machine which possesses a continuous web or filament. Applications include papermaking, printing, coating, laminating, etc.

The system is suitable for high or low speed operation, tensions being adjustable from 0 to several pounds per inch of web-width. Suitable sizes of the device are available for tensions requiring torques up to 1800 foot pounds. If operated at near zero tension, it becomes a so-called "tensionless drive." For higher torques, the company has designed special units and is ready to quote. The unit will maintain constant lineal speed regardless of the size of the roll being wound or unwound as the case may be, it is claimed. Special units for explosion proof applications in hazardous locations can be furnished subject to insurance underwriters approval.

For full information write to Cadgene Machinery Co., Inc., 75 McLean Blvd., Paterson, N. J.

Concrete Varnish

Known as Concrete Glaze, a fast-drying clear varnish has been marketed for concrete floors and other concrete surfaces in plants, warehouses and the like which are subjected to the wearing action of trucks, and other traffic which normally create a constant dust problem due to their abrading action.

The manufacturer claims that the new varnish seals the pores of concrete with a tough and lasting resinous coating that presents a clean, germ-resistant and attractive surface. The protective coating is not affected by any residual alkali in concrete; and since it has unusual resistance to acids, alkalies, grease, oil, water and steam, he believes it will outlast any other clear coating that may be used on concrete, interior or exterior surfaces.

Brushed or sprayed the glaze dries to touch within an hour, and may be walked on within three to four hours; has good footing characteristics and does not present a slippery effect under any condition; also has an insulating effect, it is claimed.

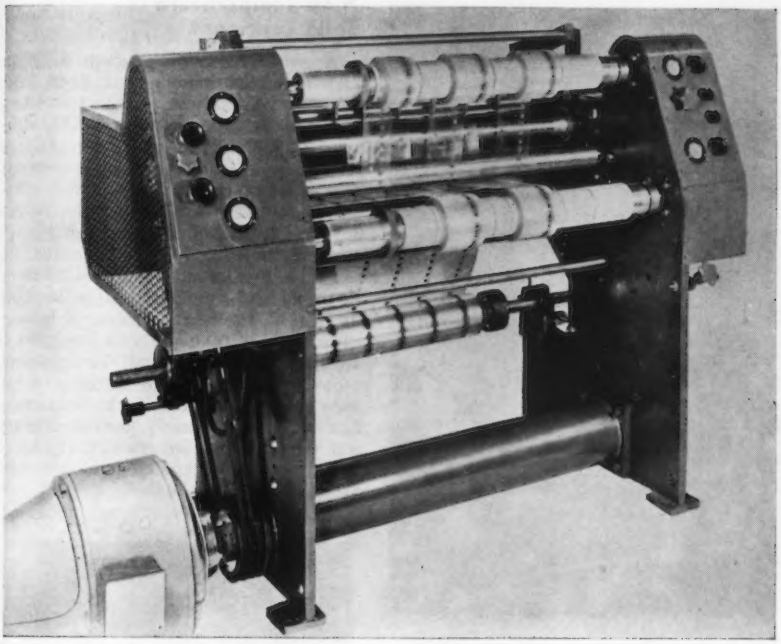
For information write to Rex Home Supply Co., 142 S. Highland Ave., Ossining, N. Y.

Non-Alkaline Steam-Cleaning Compound

Known as Magnus 72, a new type of steam-cleaning compound is recommended by the manufacturer, Magnus Chemical Co., Garwood, N. J. for use wherever steam or vapor cleaning equipment is in service.

kaline salts, it removes a serious haz-

Unique because it contains no alard of conductivity of alkaline solutions and their residues. Described as an exceptionally fast and thorough cleaner, Magnus 72 is a liquid concentrate, said to be neutral in reaction; does not streak or dull good paint; is non-corrosive; safe for operators; has no objectionable fumes and can be used indoors. Without any change in set-up, the producer believes the compound will prove ideal for cleaning paper mill equipment, and wherever dirt is oily or greasy.

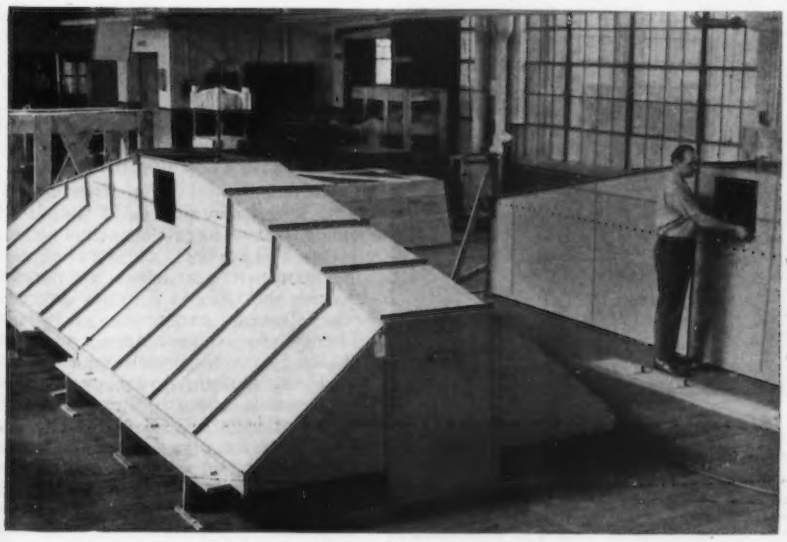


Film, Foil, Tape Slitter

A new design of slitter for plastic film, foil and pressure sensitive tape is being marketed by John Dusenbery Co., Inc., 271 Grove ave., Verona, N. J.

Designed primarily for use on large scale production slitting, it is suited for engineering development purposes for slitting new products and obtaining quantitative data on products in production. Main tension controlling devices on the payoff and rewind are air-operated to enable operators to determine the optimum running conditions for a given material, and to duplicate previous performance. The main pull rolls and grooved cutting roll are driven by adjustable slip clutches, and may be idled or overdriven to control stretch between these rolls.

Adapted for both stationary razor blade and rotary burst type cutting, the machine (Model 585) construction boasts heavy-welded steel sideframes connected by welded torque tubes, sealed ball bearings, a drive to slip clutches through roller chain, precision gears which drive slitting rolls and pull rolls.



Chemical Ducting Systems of Corrosion Resistant Plastic

Ducting systems for chemical plants made of tough, corrosion-resistant plastic are now being manufactured on a large scale by the mechanical goods division, United States Rubber Co., 1230 Sixth Ave., New York 20, N. Y. Tanks, liners, trays, hoppers, feeders, fume exhaust hoods, washers, stacks fume troughs and gutters are being specifically engineered for the handling of acids, alkalies, aliphatic hydrocarbons and other basic chemicals.

The equipment is an "all plastic" assembly, using a blend of styrene plastic and acrylonitrile rubber as the major construction material because it combines the three desirable properties of dimensional stability, toughness and chemical resistance. Reinforcing ribs, joints and corners are extruded from the plastic. Sheets used to form the sides, tops and bottoms of the ducts are of the same material. Rivets are injection molded from the plastic while bolts are machined from extruded tube stock. Joints are solvent welded with the same plastic in solution to form an airtight assembly.

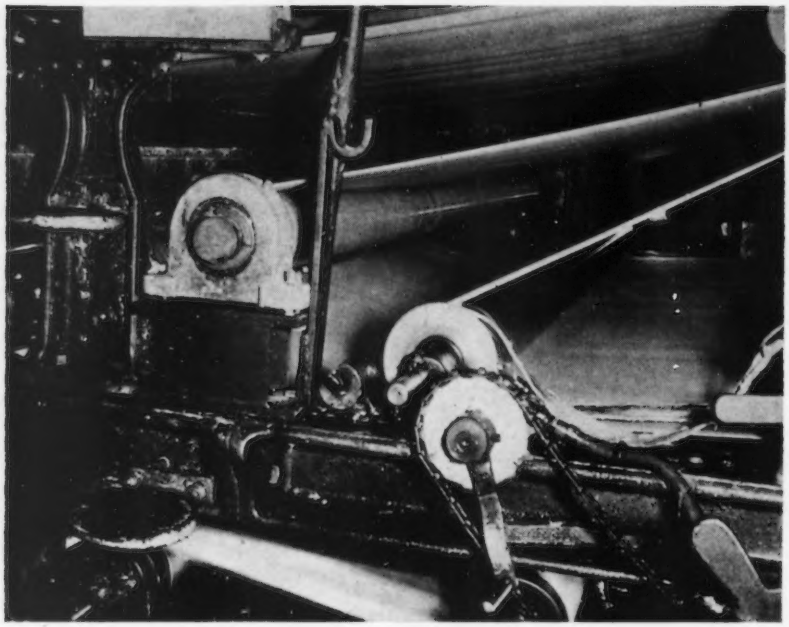
Marketed under the trade name Uscolite, the finished ducts are much cheaper than stainless steel and are said to be more durable than ordinary galvanized metal or wood. Because of their relatively light weight they are more easily installed than metal or composition ducts.

Excellent resistance to hydrochloric, hydrofluoric, phosphoric and sulfuric acids is claimed. They also resist such chemicals as sodium hydroxide, potassium hydroxide, ammonium hydroxide, calcium hydroxide, ammonium chloride, copper sulphate, ferric chloride, chlorine gas or solution, bleach solution, hydrogen peroxide (3 percent maximum) oleic acid and castor oil. The ducts also have good resistance to aliphatic hydrocarbons but are not resistant to aromatic hydrocarbons, ketones, esters or chlorinated solvents, it is stated.

Stainless Steel Paint

A stainless-steel pigmented paint which appears to be particularly good for industrial atmospheres has been developed by Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30, Pa. Applied to distribution transformers installed opposite a steel plant, the finish is said to look perfect after a year-and-a-half exposure.

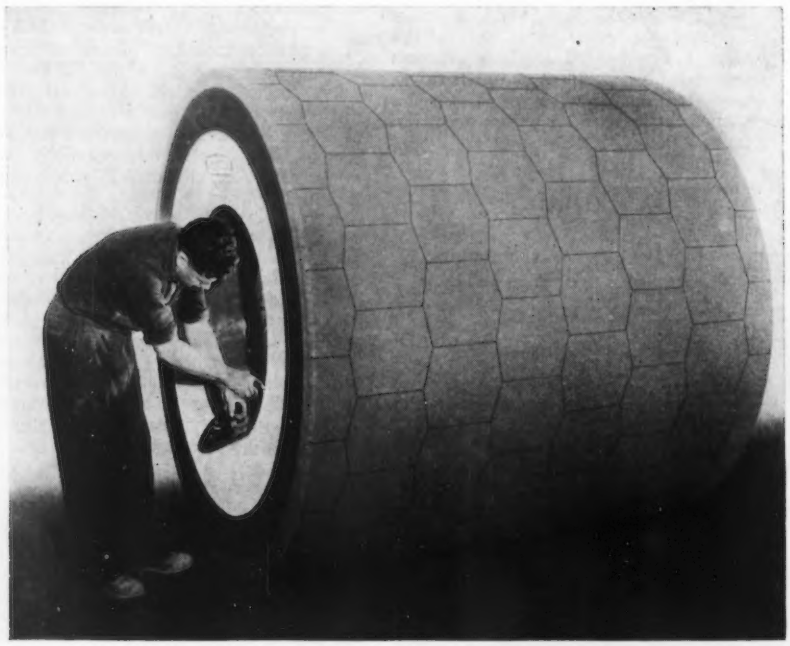
Formulated of flakes of stainless steel mixed with suitable vehicle, it has proven a very desirable paint for certain electrical equipments. Though too early to make full evaluation of results, it probably will have excellent resistance to certain types of corrosion. For example, around plants using alkali, the transformers and other equipments may be better protected with stainless steel pigments in the final coat, the manufacturer believes. For mobile transformers where a good appearing, gray, durable matte finish is desired, the stainless steel paint is now Westinghouse standard for the purpose.



Free-Wheeling Expander

According to the manufacturer, Mount Hope Machinery Co., Taunton, Mass., the use of the Free-Wheeling Expander on press-section felts on Fourdrinier machines eliminates the need of worm rolls; keeps the felt at full width; makes it possible to apply the proper amount of tension on the felt; eliminates the bowing of the seam—and, where showers are used to clean the felt, it opens the felt for a better cleaning action.

First of the new installations was made at the Pejepscot Paper Co., Brunswick, Me. Several more of similar nature were made during 1951, with the initial installation on a cylinder machine in December.



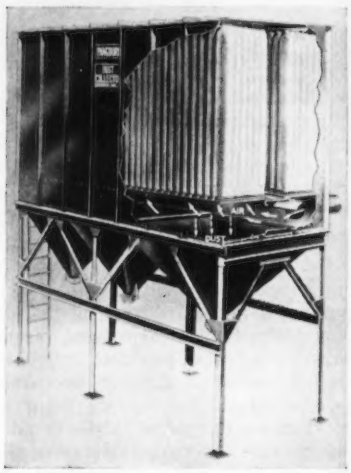
Largest Grinding Wheel Ever Made

A huge grinding wheel measuring 67x69 inches, weighing 10½ tons, and made of CRYSTOLON (silicon carbide) abrasive, recently was shipped by Norton Company's pulpstone assembly department, Worcester, Mass., to a paper mill in British Columbia. Rated the largest pulpstone ever made, the wheel will be used to grind wood into pulp for newsprint paper, and is the first of several ordered by the Canadian company. Five thousand horsepower will be required to drive this pulpstone 5000 surface feet per minute.

High Temperature Solid Lubricant

A solid, high-temperature lubricant known as Molkolube has been marketed by Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30, Pa.

A superior lubricant for moving parts that operate too hot for ordinary oils and greases, molybdenum disulfide has been available only in the form of a powder, in a water suspension, or as an additive to greases. Using a slight amount of phenolic binder, it is molded into desired solid form by heat and pressure. Sticks or brushes of molded Molkolube can be held by spring pressure against the rotating member so that some of it is wiped onto the hot surface to be lubricated. It can be used readily at temperatures to 700° F. and in some case up to 2100° F. for short periods and in inert atmospheres, it is stated.



Cloth-Bag Dust Collector

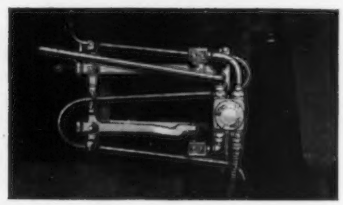
Pangborn Corp., Hagerstown, Md., offers a new cloth-bag collector for dusts such as carbon black, cork, fine wood, graphite, pigments, lime, lamp black, soap, fine tobacco, metal oxides and other dusts with similar characteristics. Simplified design of filter bags and mechanism for reclaiming dust from the bags, provides dust control at low equipment and installation cost.

The bags which range from 5 to 40 feet long, contain 1,360 to 10,880 square feet of filter cloth, employ from one to six hoppers, are supplied with the appropriate structural supports to furnish the type of disposal desired—wheel-barrow, car, truck, etc. These filters are fastened, open end down. by wing-nuts to suspension members. Each bag contains a rubber hem at the open nozzle end to insure dust-tight fitting of bags to grid plate. The nozzles, by clamping a hand knob, are sealed over grid openings in the floor of the collector. Minimum number of parts, simplified design, and easy accessibility provided by a walk-away beween the bags, make it possible to

maintain and inspect the collector easily and without tools, it is said.

When the equipment is in operation, dust-laden air piped from the plant enters the collector at a point just under the grid floor. The air loses velocity and the heavier particles fall immediaely into hoppers. The air then rises through the grid into filter bags sealed over each grid opening. All air passes through the bags on its way to the air outlet at the top of the collector.

Dust captured in the bags is removed by shutting down the exhauster and turning on the shaker motor. The shaking- and bag suspension members are combined to prevent duplication of parts and to simplify collector design. Dust shaken from the bags falls through the grid openings into hoppers. Opening a valve at the bottom of the hopper discharges dust from the collector for reclamation or disposal.



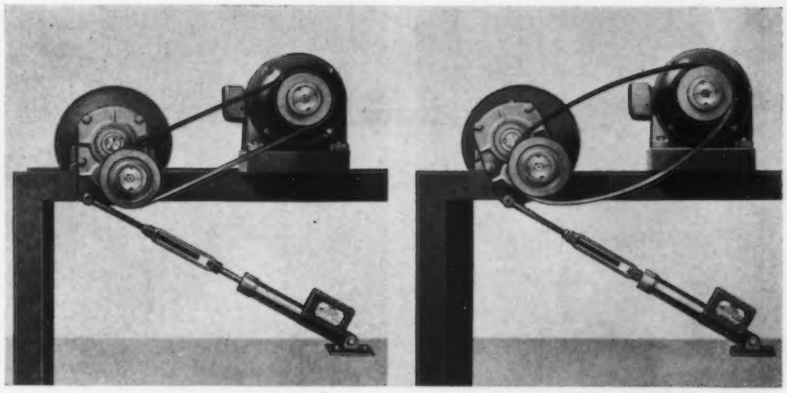
Hi-Lo Water Alarm

A new Hi-Lo Water Alarm, based on the same established thermostatic principle as the Copes Feed Water Regulator, has been announced by Northern Equipment Div., Continental Foundry & Machine Co., Erie, Pa.

Designed primarily for high-pressure service, it is said to be dependable at all working steam pressures on both stationary and marine boilers. It uses no bellows, no diaphragms, no weights, no floats, no differential pressure devices. It has no internal parts to wear or corrode. Standard audible signal is a horn; standard visible signal, lights. Unit is easily installed. It is illustrated and described in Bulletin 493.

Flexible Electric Heating Cable

A new flexible electric heating cable has been introduced to the industrial and consumer fields by Edwin L. Wiegrand Co., 7740 Thomas Blvd., Pittsburgh 8, Pa. Known as Thermwire, he cable consists of a heavy gauge nickel-chromium resistor wire with tough abrasion-resistant insulating sheath. It is designed to protect roofs, gutters, and downspouts from dangerous and costly accumulations of snow and ice. Embedded in asphalt or concrete, it melts ice from hazardous doorways, steps, sidewalks, driveways, or other pavements; prevents freezing of pipes; heats soil for faster seed germination and plant growth; and provides an easy solution in many other circumstances where a portable, pliable, efficient heat source is required on-the-spot to cope with cold weather problems.



Set **Tripped**

Overload Release

Set—Here the overload release is set, belts are tight, speed reducer in operating position ready to go. Tripped—Overload pressure has caused piston of Tri-Matic to plunge lengthwise through the unit (1) loosening belts, (2) cutting off power (3) setting off alarm.

An overload release for the Torque-Arm Speed Reducer, designed to provide instant and positive protection for driven machines, motors and the speed reducer itself, has been developed by the Dodge Manufacturing Corp., Mishawaka, Ind.

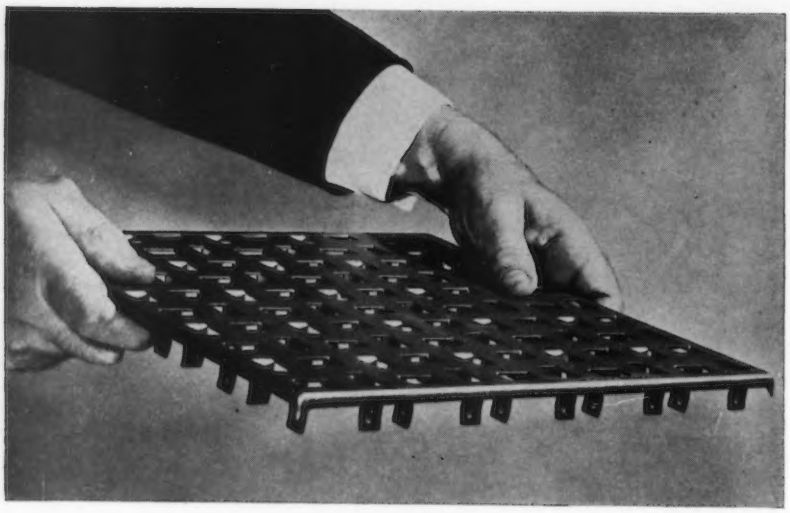
Interchangeable with the standard torque-arm regularly furnished with the Speed Reducer, the release operates both mechanically and electrically to (1) loosen the belts; (2) cut off the current; (3) activate a warning bell; siren or light. Calibrated for adjustment to the load conditions of any job, the release can be set to act at any desired load up to the reducer's maximum capacity. To reset after it has been tripped, the speed reducer is easily pulled back manually into position. This automatically cocks the overload release mechanism.

Light-Duty Grinder

The Rogers NT Junior is designed to combine speed and low cost for precision grinding of paper-cutting and other straight knives. Intended for light-duty work, it features a separate reversing motor which drives the sturdy reciprocating knife table assembly, according to the manufacturer, Samuel C. Rogers & Co., 193-210 Dutton Ave., Buffalo 11, N. Y.

Another feature is the combination of carefully-machined angular "V" and flat ways over which the table travels. These broad ways transmit all grinding pressures to the base of the machine where they are easily absorbed. Since the table action is reciprocating, the ways and bearings are worn smoothly from end to end, thus assuring long-operating life. A swivelling type knife bar on heavy trunions is fitted to the table. An index is included to allow for easy set up for bevel grinding to any desired angle.

The grinder is designed for a 10″ diameter cup grinding wheel to be driven by a separate ball bearing motor. A motor driven centrifugal pump forces an abundant amount of cooling liquid to the work for adequate quenching of the knife edge. Produced in four sizes: 32″, 38″, 48″, 60″ The stroke is adjustable to any length within these limits, it is stated.

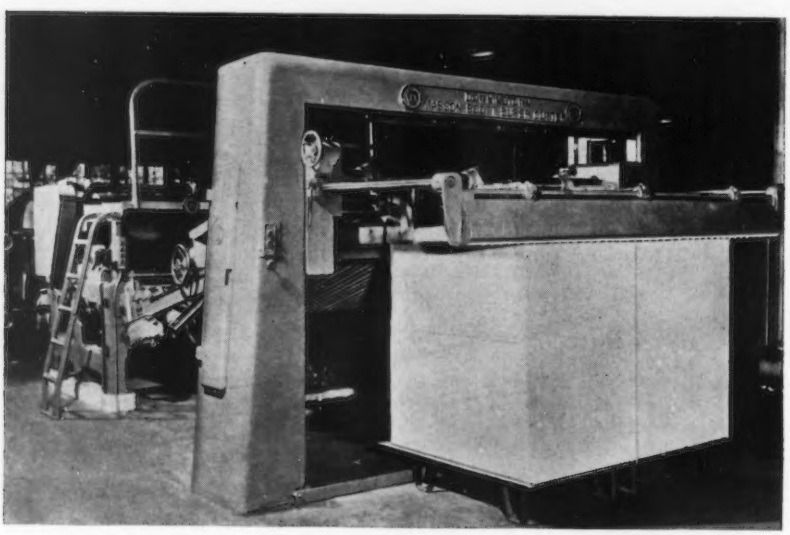


Floor Surface Reinforcement

Acme Steel Company, 2840 Archer Ave., Chicago 8, Ill., announces the availability in limited supply of Floor Plate, an 11¾-in square plate of .068-in. hot-rolled steel designed for the reinforcement and protection of concrete floor surfaces that are constantly subjected to heavy industrial loads and severe punishment.

Floor Plate can be quickly installed as a new floor surface or over old floors. No special tools are necessary for installation. Each plate contains 100 small rectangular holes approximately ½ x ¾ in. and 100 barbed prongs ¾ in. long. These prongs anchor the plate firmly to the concrete 100 times per square foot. The four rounded edges of each plate form a flange that becomes imbedded in the concrete and adds rigidity to the plate. Floor Plate has no sharp edges and cannot work loose.

Because they were designed to fill one-foot increments of floor area, there is no need for cutting to fit these plates around posts, machinery and corners. Floors protected with Floor Plate are said to be safe, whether wet or dry, because the abrasive characteristics of the exposed concrete provide resistance to slipping and skidding.



Super Cutter

Downingtown Mfg. Co., Downingtown, Pa., has just announced a new cutter being manufactured in the U. S. for the first time.

A development of the Masson-Scott Cutter and Layboy manufactured in Great Britain for a number of years, the machine is described as a high-speed precision sheet-cutting machine capable of an unusually high rate of production while maintaining a degree of accuracy not previously associated with rotary sheeting equipment.

The layboy lifts as the height of the pile increases. Operation is hydraulic and automatic according to the speed and number of sheets per minute. When the stack reaches a maximum a new skid is placed, the layboy carriage is dropped to starting position height, the cutter stops automatically and the layboy is lifted clear of the stack by push button. The stack can then be removed by a fork-truck from the front or from either side. When by simply opening a valve.

Important detail features are designed to pile exceptionally neat stacks of paper, first essential of which is accuracy of cutter with respect to length. Delivery end of the layboy is equipped with a final delivery roll driven at a minimum speed commensurate with good laying. A motor-driven centrifugal fan provides a stream of air between the sheets as they are delivered to the stack, the volume of air being controlled by a hand-operated valve. Layboy is also equipped with a stack equalizer by which the top level of the stacks of two different sheet sizes are automatically maintained at equal level. This equipment comprises a frame on which the mill skids of the long sheet are supported instead of resting on floor. As stacks build up, the skids supporting the long sheet are lifted hydraulically on the frame. The frame sinks into a channel in the floor allowing the skids to rest on the floor where they are picked up by a fork truck in the usual manner.

Teflon is rated as capable of handling temperatures from —100° to +500° continuously, and to be resistant to all known acids.

Rotherm joints are capable of handling pressures to 300 pounds steam, air, oil, gas and other fluids and are manufactured in sizes from ½″ to 5″ inclusive, and can be had with both the stationary and rotating syphon.

Roll Head Paster

News for newsprint makers is a 48-inch roll head paster recently put on the market by King Sales & Engineering Co., 435 Fulsom St., San Francisco, Calif.

Specially designed and constructed for the Crown Zellerbach Paper Co., Camas, Washington, the new paster speeds up a job that has heretofore been nearly entirely manual, cuts the adhesive bill in half, say the manufacturers.

Used with an attachmen, the machine will apply adhesive to cardboard or leather up to a half inch in thickness, in addition to heavy paper. An adjustable feature gives positive control of quantity of glue applied, and also insures uniform application to all parts of the material to which it is being applied, it is stated.

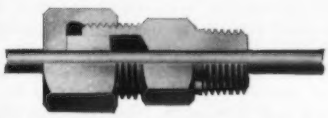
Gears and bearings are all outside of the glue area, and therefore do not undergo the terrific wear customary in machines where blue can get to the bearings and—important at clean-up time—the glue pan slides out for easy cleaning.

Telescoping Fork Extension

The Raymond Corp., 19189 Madison St., Greene, N. Y., has designed a new telescoping fork extension which remains on the elevating forks at all times.

Formed steel channel sections with a retaining bar welded underneath, fit over the regular elevating forks. A locking pin welded to the fork-extension drops into any one of a series of holes drilled in the elevating fork, making it possible to extend the fork to several desired lengths.

Designed for use on their line of electrics, the fork extensions are available on both the 2000-lb and 3000-lb capacity RAYMOND Straddle Type Electric Trucks.



Stainless Steel Packing Glands

Glands designed for general use and ease of installation in process control, pilot plant or laboratory installations are known as Conax Packing Glands, a product of Conax Corp., 4515 Main St., Buffalo 21, N. Y.

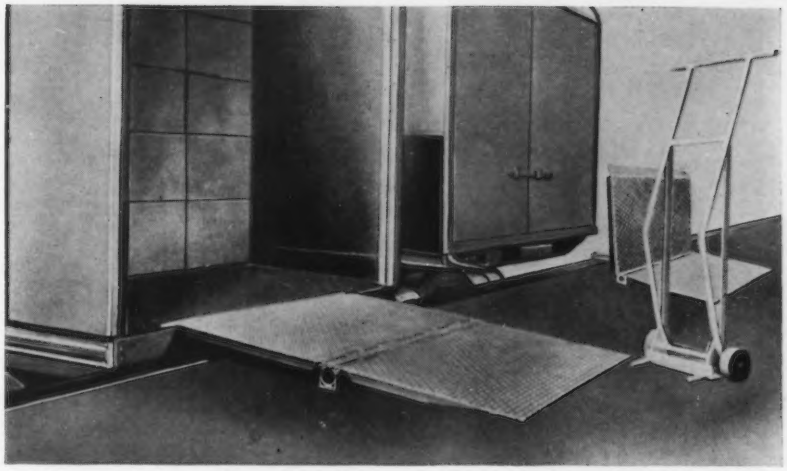
Type PG-2 and PG-4 Packing Glands are furnished with asbestos-graphite packing and may be used as small stuffing boxes or to seal static lines, thermocouple wells, dial-type thermometer stems, or any other round tubes or rods. Type PG-3 employs powdered Talc as a sealant and is therefore chemically inert and may be used at temperatures exceeding 1400°F. Type PG-3 Packing Glands cannot be used as stuffing boxes for moving parts, but provide excellent pressure or vacuum seals for stationary tubes. They are available to accommodate tubes from ⅛″ to 13/32″ (⅛″ I.P.S.) outside diameter at the present, and the company expects to increase the maximum size to ¾″ diameter in the near future.

The inside diameter of all Conax Packing Glands are bored to customers' specifications. Any plastic or other satisfactory packing material may be used in place of the material furnished with the glands with excellent results. All units are made of type 303 stainless steel throughout.

Spare Parts Kits for Life-Linestarters

To ease the problem of stocking spare parts for Life-Linestarters, kits containing complete sets of normal wearing parts are available from Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh, Pa.

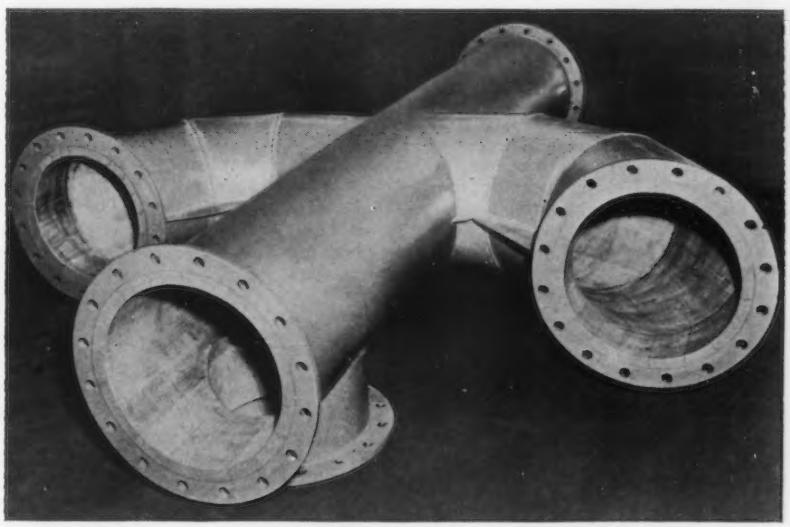
These kits contain replacement moving contacts, moving contact springs, and stationary contacts. Six different kits cover 2- and 3-pole starters in sizes N0, N1, and N2. Two 2-pole kits can be used for 4-pole starters; one 2-pole and one 3-pole kit can be used for 5-pole starters.



Portable Adjustable Ramp

A one-man operated portable, adjustable ramp has been developed by Superior Railway Products Corp., 512 Franklin Ave., Pittsburgh 21, Pa.

Hydraulically-operated — electric or hand-powered — and designed for both light and heavy loads, the ramp is double-hinged for combined strength, stability and flexibility. Features finger-tip release of leaf latch to permit easy lowering of individual leaf; automatic latch lock; ParTote dolly wheels for removal to desired location. Width is 4′, runway length 5′, rated capacity 5 tons, and is rated to take variations of the truck body above dock level with a 10 per cent grade at 6″ rise.



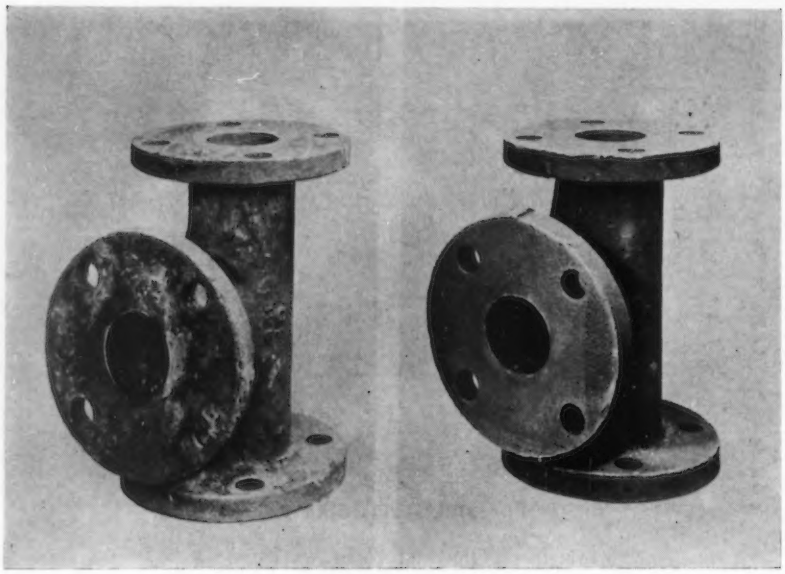
Wood-Lined Stock Pipes

Spider-like fitting and the other unusual pipe shapes were fabricated by Michigan Pipe Co., Bay City, Mich., to meet specific service requirements for use with woodlined steel pipe-lines carrying brown stock pulp to the storage system, in one of the South's largest pulp and paper mills making paper for food containers, drinking cups, file folders and other kraft specialties.

Fittings illustrated utilize linings of Douglas Fir encased in an 18″ seam-welded steel shell protected against corrosion attack. This combination affords excellent resistance to mechanical shock, hydraulic shock and impact while preventing accumulations of slime, fiber bundle and debris within the pipe lines, it is said.

Surface Rewinder

Bagley and Sewall Co., 101 Pearl St., Watertown, N. Y., announces the new No. 25 Surface Rewinder for 32 to 92″ length and up to 42″ diameter rolls, has a 2,000 f.p.m. speed capacity. Equipped with power-driven riding roll lift and air-operated slitting units for strips as narrow as ½″, the entire mechanism is fully-enclosed to insure cleanliness, and machine mounted on heavy bedplate to eliminate vibration.



Rust Remover

Pipe tee shows before (left) and after (right) Rustcleaning.

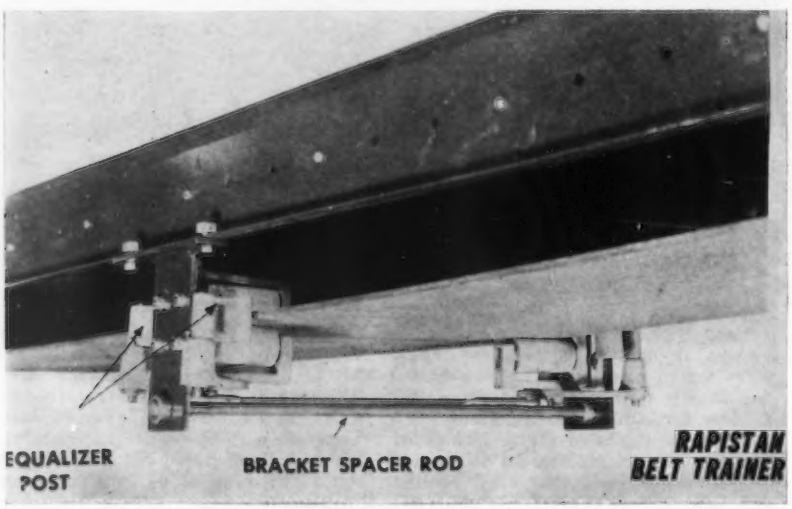
A new chemical treatment that removes rust, tarnish and light oil, chemically prepares metals for paint, and retards corrosion, is announced by Octagon Process, Inc., 15 Bank St., Staten Island 1, N. Y.

Known as Rustclean, the new compound destroys rust and rust-promoting surface contaminants, thereby retarding corrosion. Rustclean not only chemically cleans the surface of steel, iron, aluminum, zinc and cadmium, it also forms a phosphate coating which acts as a base for organic finishes. Rustclean is also an effective tarnish remover for copper and its alloys.

The two standard types are Rustclean 12 and Rustclean 15: 12, designed for a wipe-on process for large parts or in plants whose equipment or production is limited; and 15, a more concentrated compound which is used in an immersion process in a stainless steel vessel (recommended for use at elevated temperatures) or tank lined with rubber, polyethylene or asphalt. It is most effective when used at a temperature above 160°F.

For close tolerance work, Rustclean is marketed in special grades. These inhibited types will remove rust without any attack on the steel, and will prevent hydrogen embrittlement. Inhibited Rustcleans are particularly valuable for treating precision parts, such as gauges, instruments and interlocking units.

The Technical Service Dept. of Octagon Process, Inc., will furnish detailed process specifications for each type of Rustclean. Inquiries should include a description of the specific problem, as well as type of metal to be cleaned and treated.



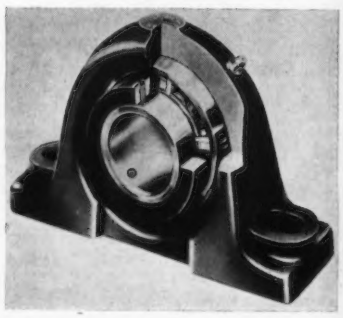
Belt Trainer

A positive-action belt trainer that automatically keeps wandering conveyor belts aligned is now being manufactured by Rapids-Standard Co. Inc., Dept BT, 342 Rapistan Bldg., Grand Rapids, Mich.

The new device can be installed on any make of conveyor which has the return belt exposed beneath the bed. It is designed for use on fabric or rubber-covered belts 3/16-inch or more thick, operating at speeds up to 200 feet per minute. The trainer does not interfere with normal conveyor operation, and does not mark or wear the belt in any way.

In use, the trainer is bolted to the flanged rails on the underside of the conveyor. Flat sides of the belt run between two sets of knurled spring loaded rollers, with the belt edges contacting two sets of equalizer posts. If the belt creeps to either side, it presses against these equalizer posts and cocks the spring-loaded knurled rolls to the new belt direction. This forces the belt immediately back into perfect alignment, and the trainer mechanism returns to normal setting ready for next belt movement.

Unit can be ordered with Rapistan Table-Veyors or Power-Veyors at time of manufacture, or can be installed on these and other makes of conveyor now in service.



Unit Pillow Block

An improved unit pillow block, with a lubricant-retaining DuPont Fairprene red seal, has been announced by SKF Industries, Inc., Philadelphia 32, Pa. Practically frictionless wiping action of the seal against the inner bearing ring is claimed for the new Hess-Bright "SY" unit.

Other features are rotating flingers to exclude dirt, a collar with set screws for easy installation, spherical outer ring compensation for initial misalignment, re-lubrication through Alemite fitting, and interchangeability with existing installations.

Designed for use in conveying, chemical, and like machinery; light fans and blowers; light power take-off units and jack shafts, etc., the "SY" eliminates costly machining, is quickly applied, factory-sealed against dirt contamination, requires infrequent lubrication and reduces maintenance costs. Shaft diameters range from 1-3/16" to 2-15/16".

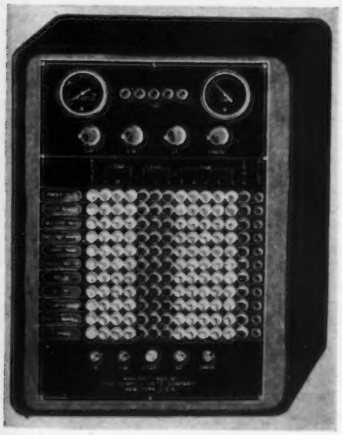
Relative Humidity and Temperature Indicator

Abbeon Supply Co., 179-15 Jamaica Ave., Jamaica 32, N. Y., announces that a new direct reading humidity and temperature indicator called the Model 186 Hygrodial is now coming off the production lines.

A direct reading instrument which shows at a glance the relative humidity and temperature of the air to which it is exposed, produced by Bendix Aviation Corp., the new precision instrument is being marketed through Abbeon.

This new indicator is said to be highly accurate and to maintain its calibration. Temperature scale is 1½" high, and covers a range of 0° to 100° F. Graduation numerals are marked at each 10° interval and are accurate to within 1° at 70°F. and within 3° at the extremes of the scale. The humidity scale is 2½" long and is graduated into equal divisions covering the range of from 0 to 100 percent relative humidity. Overall dimensions are 6" long by 4" high by 2-17/32" deep; weight approximately 9 ounces net.

The instrument is uniformly accurate over the entire relative humidity range as compared with former and competing models where distortion was a bad factor at extremes of the scale, the manufacturer claims.

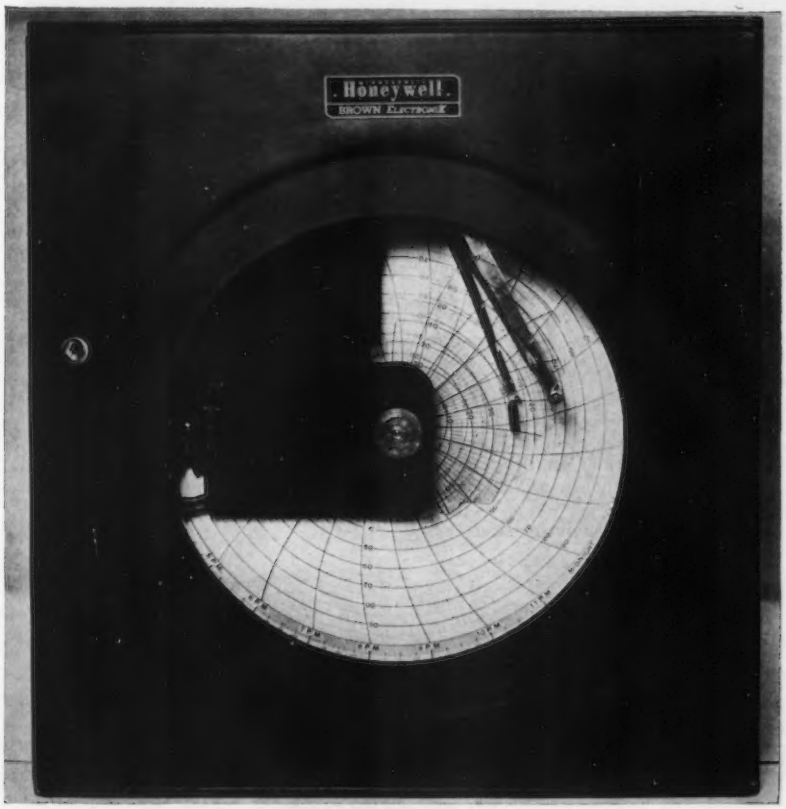


Timed Operations Preselector

The Timed Operations Preselector is announced by Henry G. Dietz Co., 12-16 Astoria Blvd., Long Island City 2, N. Y. as a revolutionary type of timer particularly suited for processes where automatic operation is desired with the greatest amount of flexibility. The unit has the particular advantage of being an electrically operated device using no cams, clutches, or other mechanical parts subject to wear. It provides for adjusting the timing of each cycle of a process independently. It can be used to energize a number of electrical devices or circuits during a single cycle of a process.

The unit illustrated in the photo is for use on laundry machinery. It selects the time, temperature, and water level of each of eleven wash cycles. It has contacts available to provide pilot light indications of circuits and means of starting and stopping the washer motor.

The unit consists of a single synchronous motor timer which delivers a repetitious fixed time impulse. Any multiple of this impulse can be preselected by means of push-buttons for the desired time interval of each cycle. Each row of pushbuttons represents a cycle of operation. Therefore, it is possible to change the time sequence of any one cycle without affecting change in any of the other cycles. There is no limit to the number of cycles, the length of the time sequence, or the number of circuits that can be handled. Operated from any value of voltage, either A.C. or D.C.



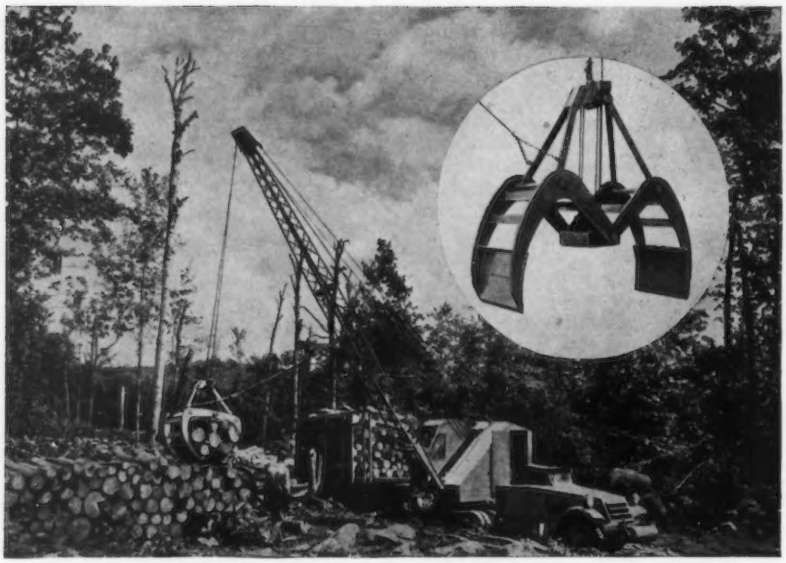
Electronic Instrument Controls

An electronically operated circular chart controller which can control industrial processes according to time-temperature schedules has been developed by Minneapolis-Honeywell Regulator Co., Brown Instruments Div., Wayne & Windrim Avenues, Philadelphia 44, Pa.

In instances where both time and temperature control are important for product quality and efficiency of operation, the new instrument has an integral-program cam mechanism which automatically positions the instrument control point in accordance with a pre-determined program. The controller combines within a single case, measurement and recording on a 12-inch chart; automatic positioning of the set point index as directed by a transparent program cam; and automatic program control of the variable.

The combination of these functions in a single instrument is said to result in economy not previously available when it has been necessary to use another instrument or device separate from the controller.

The standard Brown Continuous Balance system is used for measurement. It is available in both electric and pneumatic control. An adjustable Micro Switch assembly, operated by the cam, is optionally available. The switch assembly is used to de-energize the cam drive motor, shut down equipment, operate signal lights or perform other electrical functions at the user's option.

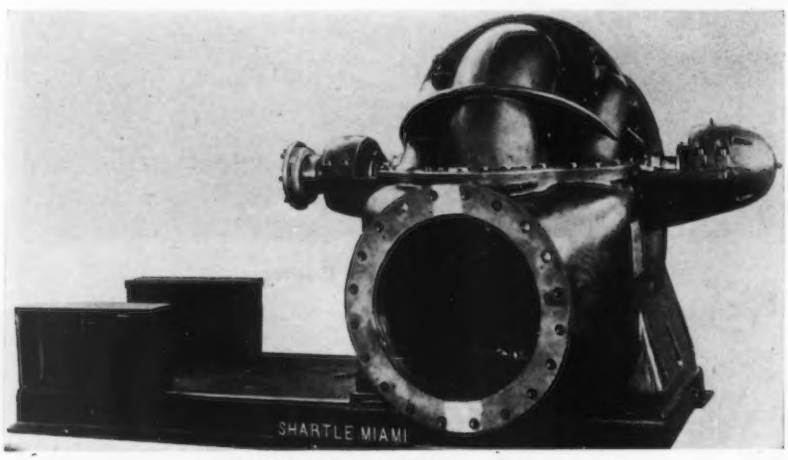


Lightweight Wood Grapple

A new all-steel welded grapple, designed to speed the loading of pulpwood, railroad ties, and similar materials with the 5-ton capacity truck-mounted Bantam crane, has been announced by Schield Bantam Co., Waverly, Iowa.

Rated at ¼-cord capacity (100″ wood), the new grapple has a tong opening of 5′3″ with a gross weight of 1155 lbs. Overall length of tong blade is 2′″, while overall grapple height is 5′2″.

According to the manufacturer, experimental woods tests by leading pulp companies, indicate a production rate of approximately 60 to 70 cords of pulpwood per day, loading partially frozen sticks from small roadside tiers to trucks, with the crane operator and one man on the ground. Where conditions were more favorable the Bantam grapples said to have loaded trucks having a capacity of 4 cords in 15 to 20 minutes. Truck-mounted Bantam cranes equipped for tagline operation and can also work with tongs or sling.



24" Centrifugal Water Pump

Shartle Bros. Machine Co., Middletown, Ohio, has added a high capacity 24″ double suction water pump to the Miami line.

Heavily constructed and featuring a fully-split casing to facilitate inspection or removal of rotating element, this giant Class "A" pump is capable of handling up to 24,000 G.P.M. of water, white water or thin stock and is especially applicable to service and flood control service. An open type impeller with removable side plates make this pump especially adaptable for pumping service or silt-laden river water.

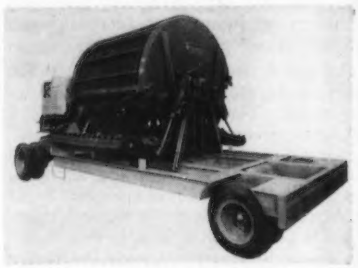
The impeller is mounted on a heavy shaft carried in oversized short centered anti-friction bearings. The pump and motor are mounted on one base.

Waste Wood Chipper

Utilizing the success, achieved in Sweden by Soderhamns, with their chippers installed in practically every sawmill there, the forced feed spout design idea was incorporated into a new chipper put into operation early in 1951 by Canadian Sumner Iron Works Ltd., Vancouver, B. C.

This chipper, installed in the new Swedish Gang Mill of Bloedel's at Port Alberni, chips satisfactorily all shapes and sizes of irregular pieces of waste wood from the dual gang-saw operation. With this chipper, instead of the standard spout design where the wood is fed by gravity, a forced-feed mechanism with fluted rolls the materials uniformly into the chipper to make even-sized chips.

While the first unit was fitted to a 75-inch Chipper with six knives for top discharge of the chips, the same forced feed mechanism could be adapted to any size of chipper required.



Portable Barker

A barking drum that can be taken right to the wood lot itself is being manufactured by D. J. Murray Mfg. Co., Wausau, Wis. and is known as the MURCO-Adams-Clark Portable Barker.

The eight sizes of the Portable Barker are designed to handle various wood lengths from 48 inches to 110 inches, and are furnished either truck, tractor or skid-mounted. They will debark all types of wood—straight or reasonably crooked, and are said to be readily maneuverable on logging sites; to be easily loaded; to discharge barked wood by gravity on conveyor, (or ground as desired) with practically no damage to the wood; no "brooming"; and with virtually no wood loss from debarking action. Easily adapted to logging conditions, simple to operate, and with low maintenance and relatively low horsepower requirements, the equipment has proved successful in barking poplar, spruce, balsam, hemlock, cedar, tamarack, and various hardwood, ranging from 3″ to 15″ in diameter, it is stated.

The model illustrated, made for the New York - Pennsylvania Co. handles 60-inch wood and weighs 21,800 pounds, less drive 10,000 pounds. It is equipped with a 50 hp. Ford 6 cylinder industrial gasoline engine, has 12 c.f.m. air compressor and is arranged for hand loading.

Phenolic Coating Resin

A modified phenolic coating resin has been developed by Carboline Co., 7603 Forsyth Blvd., St. Louis 5, Mo.

To be known as Phenoline 300, the new product bonds to nearly any surface, the manufacturer claims. The bond to steel is so effective that water quenching at 70° F., after being heated to 320° F., must go to 20 repetitions or more before there is noticeable loosening. Continuous exposure to liquids under very great variations has no measurable effect on the bond. Coatings on concrete have been subjected repeatedly to variations of 100 degrees F. (from 0° F. to 100° F.) without checking, cracking or loosening. Standard 50 lb. back water pressure tests have not loosened it either. Pipe joints made by encasing pipe ends with Phenoline 300 have held fluctuating pressures up to 420 lbs, it is stated.

Distinguishing characteristics claimed for the product are: (1.) It polymerizes at room temperature in a day's time or less; (2.) It is completely resistant to caustic soda, hot or cold; (3.) It bonds directly to almost any surface; (4.) The unpolymerized resin fluids contain no solvents and 98 per cent to 100 per cent turn into solid form upon polymerization; (5.) When it "sets", there is no evaporation of diluents or formation of water —hence no shrinkage in film formation; (6.) It can absorb a very substantial amount of filler without loss of strength. In fact, heavy filler additions alter its physical characteristics for desirable heat and impact resistance.

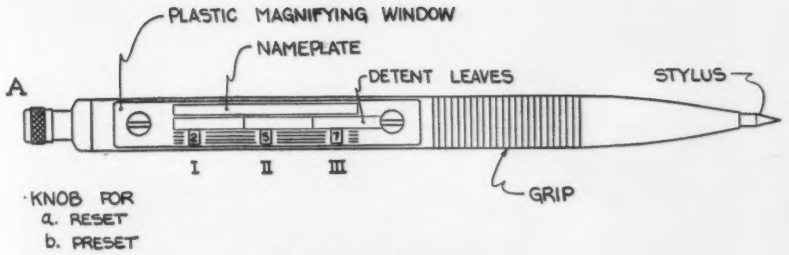
Neoprene Maintenance Coatings

The synthetic rubber, neoprene, is now produced in a form which makes it eligible for maintenance work. The product of E. I. du Pont de Nemours & Co., Wilmington 98, Del., the new material is intended for protection against splash, spill and corrosive fumes and atmospheres.

Neoprene maintenance coatings are the result of two developments: first, a slightly modified neoprene polymer which, before vulcanization, produces solvent solutions of low viscosity per unit of solids content, and second, accelerators which will cure this polymer at room temperature. Main ingredients of the coating are an aromatic solvent, carbon black, neoprene and a separately added accelerator. It dries by solvent evaporation and cures by polymerization of the neoprene.

Colors other than black can be had only at the expense of some chemical and abrasion resistance; light, pastel colors are not practical because neoprene darkens somewhat on aging.

For full report on advantages and disadvantages of the product: Address Public Relations Dept., E. I. du Pont de Nemours & Co., 8545 Nemours Bldg., Wilmington, Del.

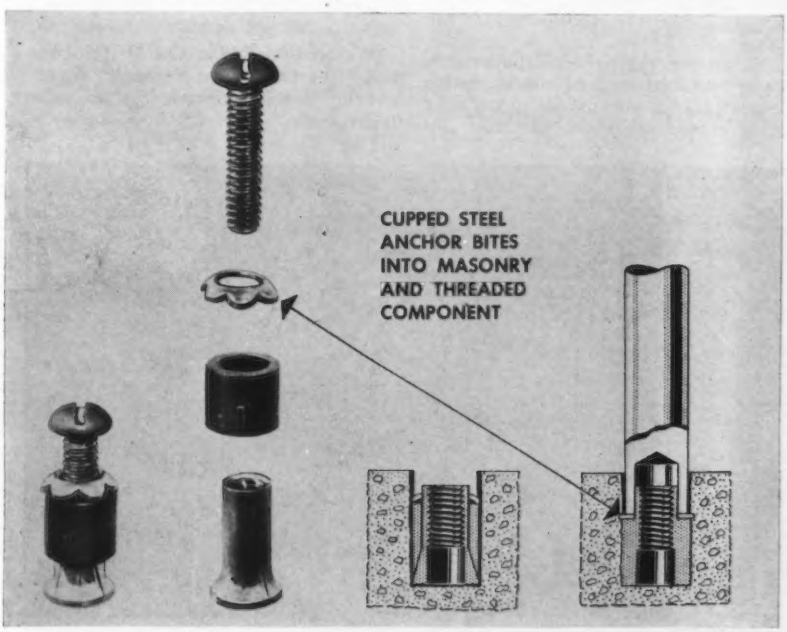


Dirt Particle Counter

The Dot Counter was designed for and to the specifications of the Air Forces photo interpreters by Mast Development Co., Davenport, Iowa. Its current applications are for counting and marking bomb hits, blood cells, dust particles, etc., and the U. S. Government takes the entire production.

Replacement of the stylus with a rubber or metal stamp would adapt the counter to industrial uses such as counting the dirt particles in pulp and paper. The maker believes it will be possible to fill a limited number of orders in July, 1952.

Housing is an anodized aluminum barrel resembling a mechanical pencil. Counter is operated by depressing the steel stylus in the end of the pencil. The stylus revolves as one pound pressure is applied, resulting in better marking of the object by the stylus. A short stroke of approximately ⅛" is required to index the counter. A maximum of 999 strokes is counted while the knob is in locked position "A." The numerals appear in separated openings covered by a decorative, magnifying, transparent plastic window. Reset knob is unlocked with inwardly to any of 3 detented positions. Thus it is possible to reset as follows: (1) Integers only; (2) Integers and the tens; (3) The entire dial at one time. This makes it possible to quickly reset to 000 or to preset to any desired count.



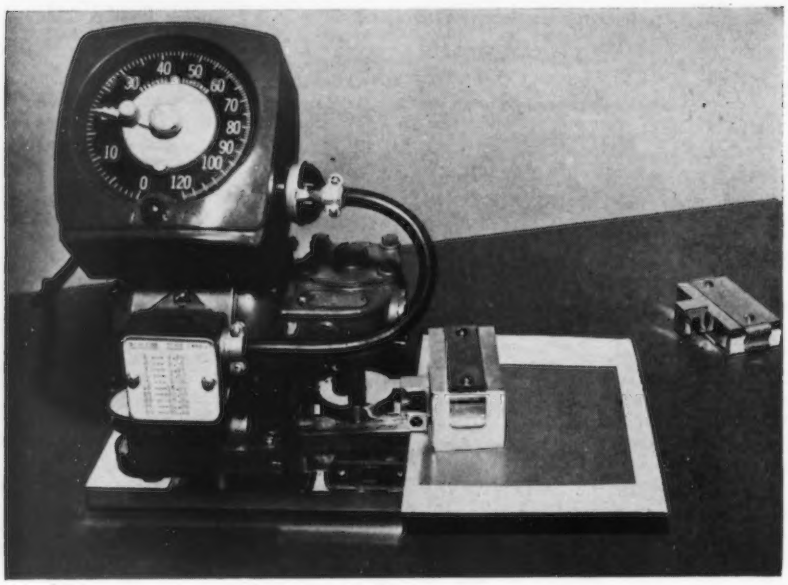
Screw Anchorage

Utilizing the rigidity of steel to supplement lead as an anchoring medium, Super-Grip Anchor Bolt Co., Inc., 3333 N. 22nd St., Philadelphia 40, Pa. has developed a new screw anchor that is easily installed and is said to provide increased anchorage strength and resistance to vibration.

The patented Super-Grip Screw Anchor can be used wherever machine screws, stove bolts or wood screws must find an anchor in brick or masonry. It provides solid anchorage, prevents loosening and pulling out even under the toughest conditions of vibration or strain, it is claimed.

The principal features are a threaded insert, lead sleeve and a cup-shaped fluted steel anchor. When driven into place, the lead mushrooms out and then the steel anchor collapses, forcing sharp edges into the masonry and the threaded component.

A tamping tool, provided with every 100 anchors, is used to mushroom the lead sleeve and flatten the steel anchor.

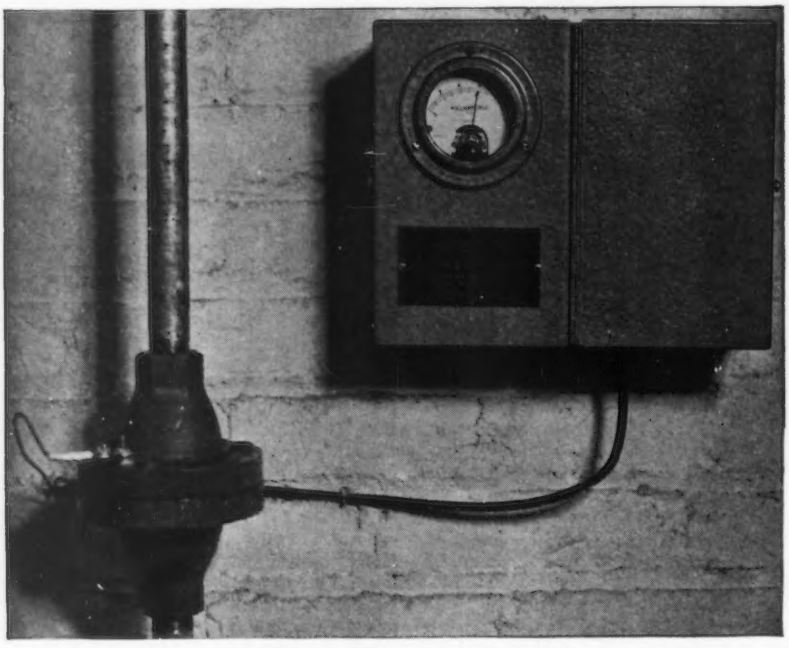


Ink Rub Tester

The Sutherland Ink Rub Tester is designed to evaluate the scuffing or rubbing resistance of an ink film on paper and paperboard.

Developed in the laboratories of the Sutherland Paper Co., Kalamazoo, Mich., after a year of experimentation by the technical staff of the company, the tester is a means for accurately testing the resistance of inks on printed cartons to rubbing. Among the tests which can be made with the tester are: dry rub, wet rub, wet bleed or transfer, wet smear, and functional rub.

Western Michigan College, Kalamazoo, was the recent recipient of one of the testers for use in its paper laboratories.



Electrical Water Treatment

A non-chemical water treatment process which eliminates hard water scale problems is being handled in this country by Heller Laboratories, 196 Morgan St., Jersey City 2, N. J.

Called Hydrotron, the new process and equipment has been in wide use in the United Kingdom as Aquastat for treating extremely hard water electrophysically, so that minerals contained in the water crystallize out in the form of a sludge or slurry and do not form a dense hard coating over heat exchange surfaces. The process is suitable for treatment of fresh or salt water and is particularly well-adapted to control scale in once-through systems, such as hot water supply systems or cooling water systems where chemicals or water softeners are not practical or the cost of such treatment is prohibitive. The process is also well-adapted for treatment of water for boilers making steam to be used in food processing, as there is no danger of contamination of food from chemicals, it is stated.

The equipment consists of a bronze pipe unit installed in the water supply line, and an electrical control unit, which is mounted in a convenient position nearby. There are no anodes to replace. The unit has unlimited life expectancy. Operation cost is only a few cents per month. The initial cost of the equipment is moderate, being less than that of a softener of comparable capacity. Simple instructions for installation and operation are supplied and a typical Hydrotron installation can be made in a few hours.

Ask for reprint "Do you have Scale Trouble in Your Evaporator?"

Paper Treating Resin

A new resin which is reported to impart greater wet-strength to paper than any other product of its type has been announced by Plaskon Div., Libbey-Owens-Ford Glass Co., Toledo, Ohio. Designated Plaskon Aminoplast 348-11L, the new resin, has shown significant improvements over both urea and melamine-formaldehyde types of wet-strength resins now in commercial use, according to the company.

Production runs and laboratory tests in leading papermaking plants have shown that the new aminoplast resin delivers up to 33% more wet tensile strength than equal amounts of urea resins. The cost of producing paper with any particular degree of wet-strength would therefore be considerably less when using the Plaskon 348-11L instead of the other types, it is stated.

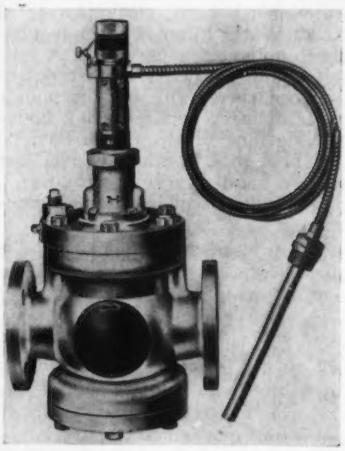
The new resin also has the important advantages of being readily soluble, even in ice water, and may be added by any of the standard methods for introducing wet-strength resins into the papermaking operation. It may be diluted for use, but can be added as it is received by the papermaker with no mixing operation required.

Some physical properties of the new resin are:

Solids	40-42%
Solvent	Water
Appearance	Clear, light brown liquid
pH	6.8-7.4
Dilutability	Infinite at all temperatures
Nitrogen (Kjeldahl Method)	11.0-11.8
Stability	At least 90 days

High-Speed Ironing of Photographic Paper

The extremely hard surface and uniform quality needed in glossy-finish photographic paper is being produced by a new drive, installed on a Perkins supercalender by Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30, Pa. in an eastern mill. In the past, the surface characteristics for glossy-finish photographic paper were acquired by high-pressure, low-speed supercalenders running at about 200 f.p.m. Output speed has been increased about 4 times and the same quality maintained, it is stated. Horsepower requirements are 0.45 hp. per inch of width per 100 ft. per minute delivery speed. This compares with 0.215 for supercalenders used in finishing coated papers.



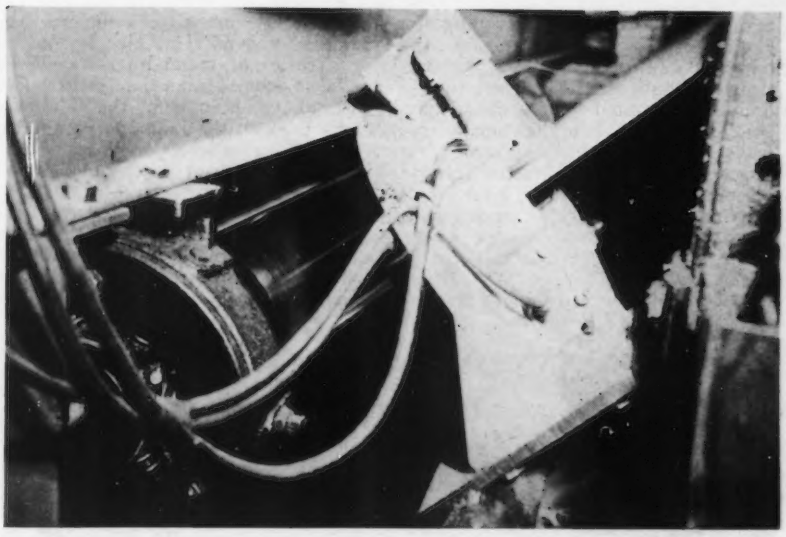
Self-Operated Temperature Regulator

A new addition has been made to the line of self-operated temperature regulators made by Farris Stacon Corp., 524 Commercial Ave., Palisades Park, N. J.

Designated as Type 1005, the regulator features design simplicity which allows quick, easy disassembly for relapping and cleaning in the field. In addition, the regulator has visual finger-tip dial control; built-in strainers to protect the pilot and main valves; stainless steel seats and discs; and internal porting to eliminate external damage and minimize maintenance.

The manufacturer claims control accuracy of plus or minus 1°F., obtained by means of a fully balanced, single-seated pilot operating on a vapor flash principle. Ninety-nine percent of the power to position the valve is taken directly from the steam, and only one percent from vapor expansion in the thermostatic system.

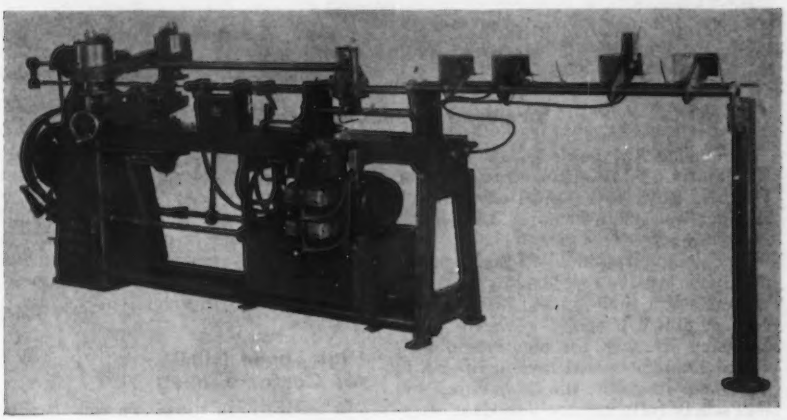
The Type 1005 Regulator is self-contained and pilot operated in sizes 2″ through 4″. It is available with 125 lb. or 250 lb. ASA flanges for steam pressures from 10 to 150 psig. and for temperature control from 30°F. to 325°F. Adjustment range is 60°F. Eight feet of capillary tubing and a 1″ NPT conection on the bulb are standard equipment.



Radioactive Beam Checks Weight of Paper in Process

Installation of BG-1 Beta Ray Gauge at Gilbert Paper Company, Menasha, Wis., is reported to provide remarkable accuracy in checking the weight and density of paper as it is being made. Produced by Tracerlab, Inc., 130 High St., Boston 10, Mass., the unit consists of two main parts: an open "C" frame gauging unit and a control panel which contains the indicator. The "C" frame is mounted on the paper machine so that the paper as it comes off the last drying roll passes through it.

At one tip of the "C" frame is the source-mount containing the radioactive material, Strontium 90. At the other tip of the "C" frame is the detector head. By measuring the amount which the Beta Rays diminish as they pass through the paper from the source to the detector, a continuous reading (accurate to ½ of 1 percent) is obtained on the weight of the paper as it is being made, Gilbert reports.



Spiral Core Winder

To meet the need of converters for long spiral-wound cores of uniform diameter and length and with clean-cut ends, the spiral core winder was developed by Paper Converting Machine Co., Green Bay, Wis. Incorporating a hydraulically-operated cutoff head equipped with score-type slitters, the unit is said to be valuable to users of automatic winding and slitting machines.

Winding head consists of the orthodox gear driven winding drums and belt, but the cutoff unit is an entirely separate unit, having no mechanical connection with the winding head. This cutoff head is fitted with a hydraulic cylinder, together with a suitable hydraulic pump, reservoir, pressure regulator and flow control valves. Using this hydraulic system, a long constant velocity stroke is obtained which can be varied to suit the speed of the core as it travels down the winding mandrel.

A second hydraulic cylinder is used

to actuate a bar cam controlling the motion of the score slitters against the hardened end of the mandrel. To control the length of the finished core, a limit switch, fitted with a metal "target," is used. When the wound core makes contact with this "target," it actuates the hydraulic system, starting the score-slitter carriage which cuts the core to length. This target mounting is adjustable, offering a simple means of varying the length of the finished core.

A core ejector, capable of moving the finished cores to the rear and parallel to the machine, completes the handling system. This ejector consists of a series of metal fingers powered by a solenoid. Immediately after the cores have been cut, these fingers carry them to the rear and parallel to the machine, where they may be collected in a dolly or other suitable carrier.

Other refinements which have been incorporated in this machine include a heated, thermostatically controlled front adhesive unit and roll stand, and a rear roll stand arranged for a flying web splice.

Armored Chemical Porcelain

Tufclad is the name given by Lapp Insulator Co., Inc., Process Equipment Div., Le Roy, N. Y. to its new line of chemical porcelain armored with fiberglass-reinforced plastic.

The armor is applied in the form of multiple layers of heavy fiberglass woven cloth, impregnated with a special modified phenolic resin of high adhesive strength for bonding to porcelain and between layers of cloth. Jet black in color, the oven-cured armor shell fully covers porcelain, running end-to-end and under flanges.

Advantages of Tufclad armor are said to include the fact that the resilient armor shell acts as a cushion to protect against impact damage in handling or operation — and insulates porcelain against thermal shock. In its own right, the shell is homogenous and tough. It is held to be capable of holding operating line pressures against gross leakage even though porcelain is cracked or broken. Telltale leakage will signal damage, but safely to personnel and loss of product are assured by at least temporary control of lines in case of accident.

Tufclad armoring is regularly available on all Lapp standard Y valves, flush valves, pipe and fittings ½" to 6", plug cocks, safety valves, flush valves, pipe and fittings ½" to 8". In addition, the armoring method makes it readily adaptable to special shapes—tower sections, nozzles, covers, etc. it is stated.

High Speed Glue for Carton Sealing

A new high-speed carton sealing glue has been released for general sale by Stein-Hall & Co. Inc., 285 Madison Ave., New York 17, N. Y.

Called Cart-N-See! 233-H, and available in ready-to-use form, the new glue is the result of two years of laboratory research and field tests. The manufacturer claims that the new glue not only gave outstandingly successful adhesion in every such test but enabled customers to speed up their machines. Both 233H and the heavier version, 233HH, have been tested for other packaging operations such as case sealing, tight wrapping, and double package-making with superior results.

Rotary Screen Water Filter

For fine screening of raw intake water, hot pond or cleanup water, the North Water Filter is rated as adaptable to unlimited applications. A rotary, self-cleaning, gravity type screen unit, designed specifically for the pulp and paper industry by Green Bay Foundry and Machine Works, Green Bay, Wis., it is built in 4, 6, 8 and 10 feet screen sizes to handle varying capacities, and comes fully assembled, ready for operation.

Where desired, the unit can be supplied with a special phenolic-resin coating to add acid- and alkali-resistant properties to the metals; the discharge spout can be extended up to four feet beyond the machine proper for easy disposition of solids; special small cast-iron end-frames can be supplied for fitting into concrete pits; any size mesh wire can be furnished and in any material; perforated plates can be supplied around the cylinder instead of wire mesh for some applications; any size inlet aperture can be selected for convenient piping. All inlets and outlets are standard American flange connections. Shower hood covering the cylinder can be fabricated for special installation.

Heavy Duty Cleaning Unit

Announcement is made by Kelite Products, Inc., 1250 North Main St., Los Angeles 12, Calif. that their heavy-duty steam cleaning unit is now in production. Known as Power Master Unit, the machine is designed for industrial maintenance, construction and other cleaning operations.

Power Master Unit has two high pressure steam guns, each delivering 150 g.p.h. In addition to the unusually large steam cleaning capacity, the unit embodies a high-pressure water gun supplying hot or cold water at a pressure of 500 psi. Power blast feature of the unit delivers 1,000 gallons of water per hour for blasting away accumulations of mud, muck, heavy grease, etc. The water gun also has been found efficient in de-icing operations, it is said.

Fully illustrated literature may be had upon request to the manufacturer.

Dry Chemical Fire Extinguisher

The addition of a new Dry Chemical Fire Extinguisher is announced by the Fyr-Fyter Co., Dayton, Ohio.

Combining the practical features of known methods of discharging dry chemical under pressure with exclusive features of Fyr-Fyter design, the new unit is described as a sturdy but lightweight unit of stainless steel and aluminum which tests to 500 lbs. pressure. In many tests the extinguishers have gone as high as 1250 lbs. before rupturing, it is said.

The chemical used is a special fire-killing powder, fine enough to give maximum extinguishing effect on fire yet coarse enough to be discharged in a long-range stream. Repellent to moisture, it also is said to be non-abrasive and corrosion-free, and harmless to everything but fire.

Finger-tip nozzle control is designed to prove quick, easy-controlled blasts of powder when needed, and to assure complete shut-off to conserve unused chemical. Other construction features assure from 95 percent to complete discharge of tank contents. A large, easy-to-hold handle makes carrying easy and provides leverage to puncture the pressure cartridge by downward thrust.

Vinyl Resin Latices

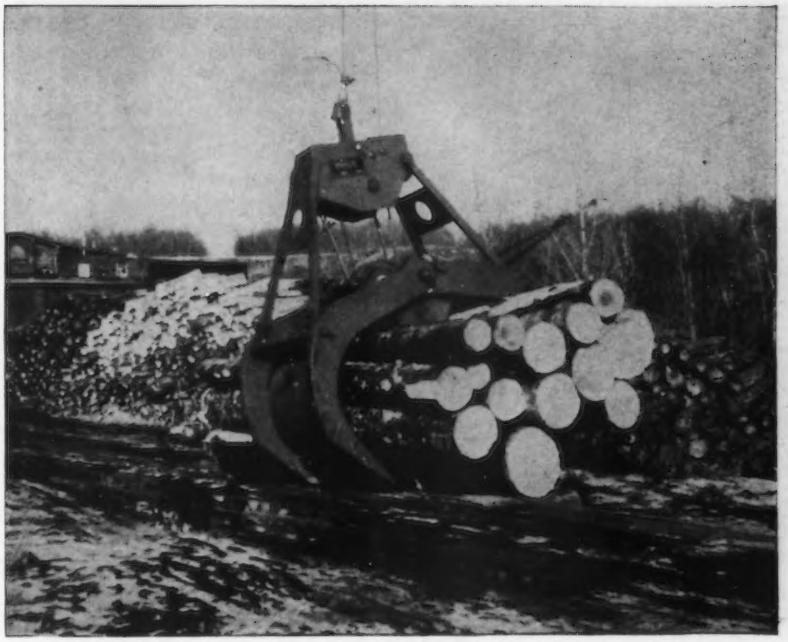
The first in a series of new vinyl resin latices is now being produced for commercial consumption by Goodyear Tire & Rubber Co., Chemical Div., Akron, Ohio.

Known as Pliovic Latex 300, the vinyl latex is described as an aqueous dispersion of a vinyl chloride copolymer, and is the most recent development in Goodyear's vigorous expansion in the vinyl field. Completion of a preliminary testing program indicates that the vinyl latex should find wide use in the textile and paper coating industries, it was stated. Grease-proofness, chemical resistance, and resistance to moisture are some of the special properties imparted to fabrics and papers coated with the material. Physical properties are also improved. Samples are available.

High Temperature Paint

A high temperature paint with excellent refractory properties is the product of Tempil Corp., 11 West 25th St., New York 10, N. Y.

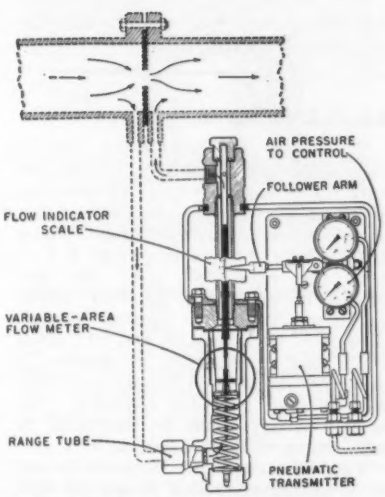
Known as Pyromark, the new paint is applied like ordinary paint by brushing or spraying, dries quickly to a firm coat with good adhering qualities, and is recommended by the manufacturer for applications where considerable vibration, high velocity gas streams or high angular velocities are encountered. Available in green, maroon, blue, white, black or gray, the paint will survive temperatures of 2500° F. and higher, provided the surface to which it is to be applied will not of itself scale off, it is stated. Descriptive bulletin available.



Pulpwood Grapple

A new grapple for handling pulpwood and ties is announced by Mack Welding Co., 9206 Grand Avenue Pl., Duluth 8, Minn.

Of welded steel construction, with Zerk grease fittings inset at all points, replaceable bronze bushings in sheaves, and steel bearings at other moving parts, the grapple comes in four standard sizes: ¼ cord, ½ cord, ¾ cord and 1 cord. (Special size grapples and tongs to customer's order.) Wedge type swivel wire rope lifting and dead-end connectors are furnished to assure positive and easy rope connection.



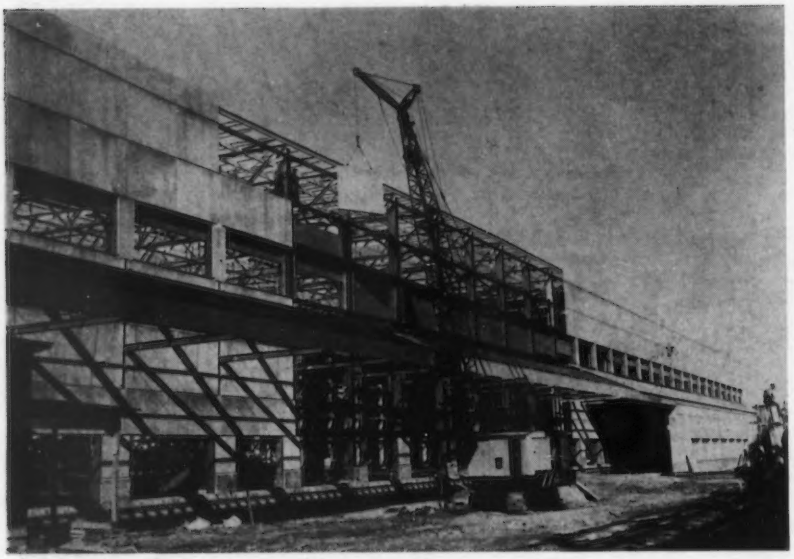
V/A Call For Orifice Metering

With a new product, known as the V/A Cell, the Fischer & Porter Co., Hatboro, Pa., introduces an entirely new approach to orifice metering. Instead of measuring the static-pressure differential across the orifice as do conventional mercury manometers, the unit meters a continuous by-pass stream around that orifice.

In the pulp and paper industry, its characteristics of kinetic action, linearity, rangeability, flexibility and pneumatic transmission offer improvement in air, water, steam and thin liquor metering, it is stated. Lead-line clogging is reduced and the need for steam condensate pots eliminated. The wide rangeability inherent in the new method and the flexibility provided by simple replacement of the by-pass restriction (the range tube) offers new versatility in instrumentation. Further, the compactness of the unit, the point-of-measurement flow-indicator and the pneumatic activation of devises at remote points and panels per mits greater freedom in piping and plant layout.

The principal parts ot the V/A Cell are: a variable-area meter whose float position inside a tapered tube changes with flow; a balanced follower arm, magnetically linked to the float; and a pneumatic unit for transmitting flow-rate measurement to remotely-located recorders, indicators, totalizers, ratio controllers or other receiving instruments.

To satisfy wide metering requirements, the V/A Cell is manufactured in two models: one with working pressure rating of 1040 p.s.i. at 350° F. or 1200 p.s.i. at 100°F.; the other rated at 2600 p.s.i. at 350°F. or 3000 p.s.i. at 100°F. All floates, float chambers and range tubes are inspected for performances and dimension.



Precast Concrete Wall Panels

Insulated precast concrete wall panels are being produced by Marietta Concrete Corporation, Marietta, Ohio, for the erection of one of the nation's largest industrial plants. Developed as non-load bearing walls, the panels are reported to be cutting construction costs by one-third.

Five-inches in thickness, of laminated or sandwich construction in which 1½ inches of rigid insulation separates interior and exterior layers of concrete each 1¾ inches thick, the panels are cast in steel forms by a production line method, trucked to the job and put in place by cranes.

Pictured are the panels being set in place at Union Carbide and Carbon Corporation's new development in Marietta, Ohio.

Typical panels come in two basic nominal sizes—8 x 8 ft. and 8 x 10 ft., with specials as required—and are cast with a tolerance in dimensions and warping of plus or minus 1/16-inch. Panels are uniform in appearance and differences in color have been reduced to a minimum.

For information concerning design and production write to Marietta's Engineering Department.

Ridged Core for Paper Roll Cores

A new plug for insertion in the ends of paper roll cores has been developed by Souhegan Mills, Inc., Wilton, N. H.

Molded from resin-bonded wood particles, the plug is stronger, more uniform and more accurate than wooden plugs, it is claimed. For extra gripping power it has eight ridges molded into its circumference, will not check, crack, or shrink, yet costs no more than wood, it is stated.

Small Chip Screen

To meet the need of a small capacity chip screen to operate in conjunction with waste wood chippers in sawmills, a compact vibrating chip screen has been constructed by Canadian Sumner Iron Works, Ltd., Vancouver, B. C.

Of the three-deck type, this chip screen is suspended by four cables anchored in heavy spring mounts. Screen is 12 feet long and 51 inches wide, and is designed to screen 12 units per hour or 15 units per hour with a chip spreader installed. The screen design could be increased to suit any special installation.

The vibration unit, fitted with cut steel gears, assembled in an oil-tight dust-proof cast steel housing, is operated by a 10 hp. electric motor with V-belt drive.

The first screen, delivered several months ago, is said to be giving entire satisfaction at Western Forest Industries Ltd., Honeymoon Bay, Vancouver Island. Chips at this sawmill are produced from mill waste with a Sumner 54-inch, eight-knife chipper and are delivered by truck and trailer to the MacMillan pulpmill at Marmac, B. C.

3-Aminopropanol

American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y., has made 3-aminopropanol available in trial lots for the first time for evaluation in the chemical and allied industries.

Chemical properties of 3-aminopropanol are similar to those of other amino alcohols having primary amino and hydroxyl groups. However, the three-carbon separation between the two groups results in behavior more typical of the individual groups than is found in currently available amino alcohols, it is stated.

It is suggested by the manufacturer that this product be investigated for use in the synthesis of soaps and other surface active agents, dyestuffs, pharmaceuticals and resins. New Product Bulletin No. 25 describing its properties and experimental lots of 3-aminopropanol is available.

Dynel Valve Covers

New valve and flange covers, designed to provide protection against leakage without hindering normal operation, have been introduced by Mine Safety Appliances Co., Braddock, Thomas, and Meade Streets, Pittsburgh 8, Pa. They are said to cost only one-third as much as previous covers.

Made of Dynel, a staple fabric which is highly resistant to acids as well as caustics, ChemKovers are said to have sufficient strength to contain sprays resulting from gasket or packing failures in pressurized lines. Not a treated fabric, Dynel has inherent qualities which give it the resistant properties desired. It will not support combustion and is easily cleaned.

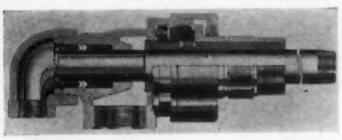
The new covers require no special tools to install and can be removed easily and quickly when lines require repair. They are designed to fit all styles and sizes of valves and flanges. Complete details have been published in Bulletin No. CF-27, available without charge from the manufacturer.

No-Prep Vinyl Primer

A new vinyl primer specifically developed for use on rusted steel surfaces without the necessity for previous preparation is announced by U. S. Stoneware Co., Akron, Ohio.

Known as Tygorust, it is easily applied by brushing, spraying, or dipping; dries hard and can be overcoated in a matter of minutes; adheres tentaciously to rusted steel, damp or dry; and, can be used with any type of finish coating — particularly vinyls.

Under exaggerated test conditions, the manufacturer claims the primer has been brushed and sprayed on damp rusted panels, and also brushed on dripping wet rusted panels, with completely satisfactory results. Dry, rusted steel has been successfully primed without even wire-brushing. It can also be applied to old, oxidized paint films (bituminous coatings excepted) without lifting or bleeding and can be safely overcoated with vinyl, nitrocellulose, alkyd and oil based finishes.



Revolving Joint

Rotherm Engineering Co., Inc., 4911 West Irving Park Rd., Chicago 41, Ill., announces a new revolving joint which compensates for all roll misalignment, requires no lubrication, can be mounted with solid piping for use on steam, and by changing the rotor and nut, it can be used with flexible hose if necessary.

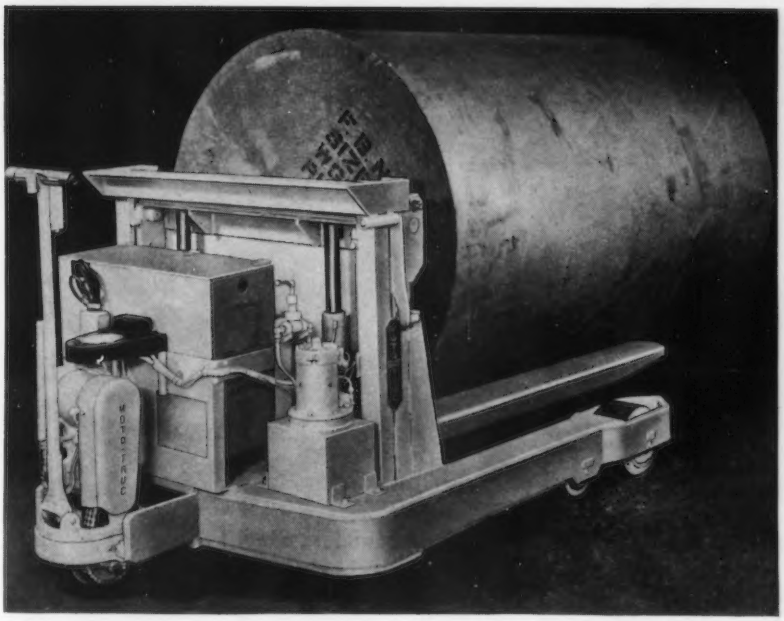
Rotation takes place on the flat face of a non-porous carbon disc, the opposite side of which is a ball seat. This design permits the rotor to find its own rotating center, and to compensate for all piping misalignment. Because of its ball shape, the carbon will not break if subjected to pressure or shock. Inside of the casing is sealed by a spring-seated Teflon wedge seal, which acts as an expansion joint as well as taking care of all roll-end play.

Twin Seal Plug Valve

A cast-steel, general twin seal valve is available from Kerotest Mfg. Co., 2525 Liberty Ave., Pittsburgh 22, Pa.

Featuring easy, positive operation, with special applications in pulp and paper industries, the manufacturer claims for it five points of superiority: (1) shuts off vapor-tight; (2) easy to operate; (3) no lubrication; (4) quick opening and closing; (5) no scoring of seats—seats rotate free of body wall.

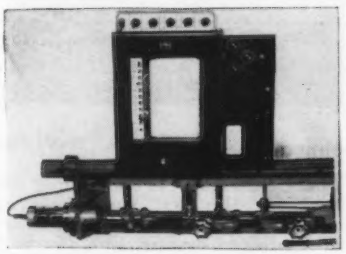
Write to Kerotest for Bulletin No. TS-50.



Paper Roll Lift Truck

Manufactured by Moto-Truc Co., 1984 E. 59th St., Cleveland 3, Ohio, the new lift truck is specially designed for handling paper rolls. Known as Moto-Truc Model SCB, the unit can be used for box car unloading as well as for general factory and warehouse use.

Truck is powered by an 18-volt battery power unit and has an 8-foot load length. Maximum hydraulic lift is 14 inches. Ten-inch and 7-inch dual load wheels are designed to eliminate the hazard of one set becoming wedged in floor slats. Travel speed loaded is 2½ m.p.h., unloaded 3 m.p.h. "Dead man" controls are standard, with automotive type brake applied to the drive wheel. Truck is designed as a "Walkie" to afford minimum turning radius.



Inertialess Weighing Systems

Scott Testers, Inc., 151 Blackstone St., Providence, R. I., announce an entirely new electrical weighing system for application to existing Scott Testers of the pendulum type.

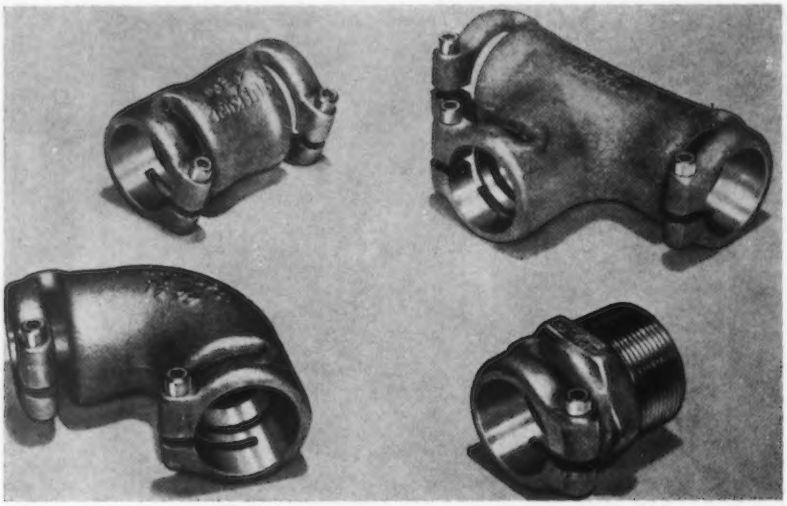
This new Inertialess Weighing System replaces the conventional pendulum type head and recorder, converting the tester from constant-speed-of-pull operation to constant-rate-of-extension.

In summary, it is a conversion kit for changing existing constant-speed-of-pull testers, in the field, to perform tests on the constant-rate-of-extension principle, with ability to compress or magnify either the load or extension on the recording chart.

Application of the new System to existing Scott Testers is described as extremely simple. It may be installed on Models J, L, Q and X-3. The replacement, which can be made by non-mechanical personnel, requires about a half hour, consisting of removing the pendulum head by loosening four bolts and installing the new elastic spool head with the same four bolts. With equal ease, the potentiometer recorder replaces the old recorder. Current is applied by plugging into any 110-120V outlet.

Advantages claimed for the new system are: (1) as the name implies, inertia is practically eliminated from the weighing mechanism. The improved sensitivity reflects the behavior of the specimen in more minute detail, particularly when minute changes are magnified as described above; (2) it is now possible to apply a constant rate of extension (the elastic spool of the weighing head elongates only .0015" maximum, negligible consideration; (3) the flexibility of drive and recorder rates and wide range of chart speeds available, permits new studies of progressive test stages.

Conversions are available from 2 to 10 lbs. to 400-to-2,000 lbs. The change from one capacity to another is readily accomplished by changing the elastic member rather than the entire head. This again can be accomplished by non-mechanical personnel, without special tools, it is stated.



Threadless, No Weld Stainless Steel Fitting

Announced is an economical stainless steel fitting for joining pipe or tube without threading or welding. Designed to reduce assembly costs and to permit the use of less expensive lighter wall tubing, Quikupl stainless steel elbows, tees, couplings, reducers and adapters are produced by Cooper Alloy Foundry Co., Hillside, N. J.

Chief advantage claimed for the new fitting is that it can be joined to tube or pipe without threading, flaring, sweat soldering, brazing, beading or welding. All that is required is to cut the tube or pipe to length and deburr; insert in fitting and complete the joint by tightening a small screw.

A free-flowing stainless steel fitting, Quikupl is in the 150 p.s.i. class. In appearance, it resembles standard shapes with the addition of a clamp which is an integral part of unit. By means of a screw and hex wrench, assembly is quick, downtime cut to a minimum, it is stated. Synthetic sealing rings are provided to assure pressure-tight joints at all times.

The manufacturer recommends the fittings for applications involving the processing of corrosive liquids or where contamination is an important factor. Can be used in new lines or to replace existing systems now showing signs of leakage.

Industrial Dust Pan

A new type of industrial dust pan which replaces the old fashioned shovel is announced by the Palmer-Shile Co., 12655 Mansfield, Detroit 27, Mich.

Lightweight — weighs 45 lbs., all-welded — constructed to withstand rough usage in industrial plants, it can be moved around into places too restricted for a wheelbarrow, and the debris swept in. Metal pan is made of 16 gauge sheet steel; measures 18″ x 18″ x 18″. Frame is of 1″ x 1½″ x ⅛″ angle iron with handle of 1″ tubing. Overall height is 48″. Has two 8″ rubber-tired, ball-bearing wheels.

Gammagage

The Gammagage is now being displayed for the first time following successful plant trials at the Newcastle mill of Fraser Company Ltd., in one of the most important problems facing the operators of kraft mills, corrosion in their pulp digesters.

A special Corrosion project has been undertaken by the Pulp & Paper Research Institute of Canada, finances being provided by 13 Canadian paper companies. In this work, the Institute asked Isotope Products, a new company established in Oakville, Ont., to develop an instrument for very accurate thickness determination. The Gammagage is the result of collaboration between the two organizations.

The new instrument uses the more penetrating Gamma rays, which, far from being stopped by a sheet of paper, will go through many inches of steel. They also will go through several inches of heat insulation, as well and still pick up fine detail on the inside surface of the wall beneath the insulation. All measurements can be made entirely from the outside of digesters, with the further important feature that no shutdown of the digester is required. As soon as the digester is blown, corrosion measurements can be made and danger areas can easily be explored in an hour or two between cooks.

Moreover, measurements are not made merely at single points, but continuously as the measuring head is moved along the outside of the digester. This is possible since the head does not have to make direct contact with the surface and paint, scale and rough surfaces do not worry it. To facilitate these direct readings, the head is mounted on a three-wheel trolley and the measurement is recorded continuously on a portable head recorder.

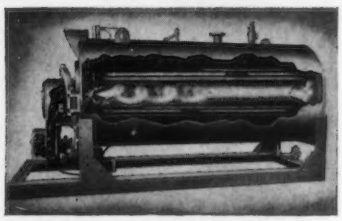
Both the Betameter and the Gammagage can be used in other industries: The betameter for measurement of plastic, rubber, metal, and other sheet materials, the Gammagage for inspection of pipes, boilers and chemical plant vessels. Both instruments have also valuable applications in the defense field.

High Accuracy Tachometer

Extremely high accuracy, ¼% of any speed being measured is claimed with new Metron tachometers now available from Metron Instrument Co., 432 Lincoln St., Denver 9, Colo. Ideal for turbine overspeed tests, production motor test stands, dynamometer test stands, laboratories, and similar precision speed measuring applications.

Ten overlapping and adjoining ranges, instantly selected by rotary switch, provide more than a 10 to 1 spread in speed. The indicating meter has three scales selected for good readability of minor divisions in integral numbers. Speeds of 36 to 100,000 RPM are covered by three models. Accuracy is sustained, it is said, even under adverse external conditions, by simple calibration adjustments, conveniently mounted on the front of the instrument.

The Fixed Installation Indicator is suited for panel or bracket mounting. The indicating meter is mounted in sponge rubber for ruggedness. Hand Engagement or Fixed Installation Heads for a wide variety of speed engaging applications are available for use with the indicator, and the two are connected by an electric cable provided by the manufacturer.



Packaged Steam Generator

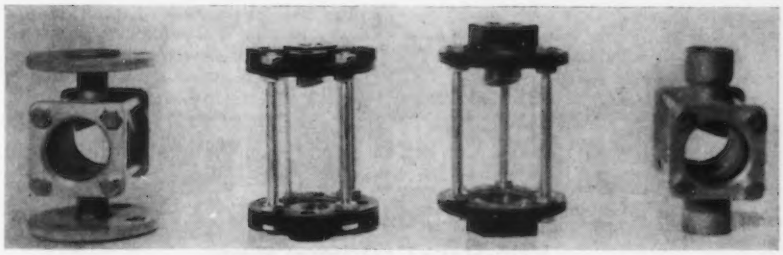
Simplicity in design and construction features the new Packaged Steam Generator announced by the Boiler Engineering and Supply Company, Phoenixville, Pa.

Fully automatic and self-contained, it is said to be easy to install, highly efficient, and economical to maintain. One of the boiler's important features is that front and back can be opened in 15-20 minutes, providing ready access for interior cleaning and servicing.

Available for use with heavy oil, light oil, gas or a combination, and in sizes from 10 to 500 hp., for 15 to 200 lbs. operating pressures, the unit is ready to operate when service connection are made.

The Continental unit is an improved 2-pass version of the Scotch Marine type boiler. Efficiency is claimed to be at least 80 percent, with steam moisture content under 1 percent. Operation of burner can be modulated from 35 percent to 125 percent, providing for periodic oversurge when required. To assure maximum heat transfer and low flue gas temperature, all fuel is burned in the water-surrounded boiler furnace, and the gases pass spirally through large 3" tubes. The 2-pass construction eliminates excess refractory, since the only refractory required is at the back of the boiler. A dry pipe in the boiler removes condensate from the steam to keep moisture content low. Also the steam tends to remain dry since a constant water level is automatically maintained, keeping the steam area uniform.

Equipped with the latest in automatic controls to minimize operating costs, further savings are said to result from an exclusive technique of rotary firing that assures maximum heat transfer. Another operating economy is gained by the burner and fan drive which is a standard motor with low horsepower requirements. The fan used is a forced draft type since it handles only clean air at boiler room temperatures, rather than flue gases at high temperature as with an induced draft fan.



Sight Flow Glass Conserves Alloys

A new type of Sight Flow Glass designed to conserve critical alloys is announced by Grand Machine & Tool Company, 692-694 East Grand Ave., Rahway, N. J.

Instead of being of heavy cast stainless steel, all metal parts of these new glasses in contact with liquids are made of heavy-gauge rolled stainless steel. Strength is not reduced in any way, it is stated, and a 60 percent saving in stainless steel is reflected in the sales price.

Manufactured in various models, in flanged or screwed types, the glasses are designed for universal use in schedule 5, 10, and 40 piping systems and are available from stock made of Type 304 and Type 316 stainless steel and carbon steel. Various alloys and coatings are also obtainable.

Air Drier

A new electric dehumidifier that can remove from the air up to three gallons of water every day is available from Westinghouse Electric Corp., Electric Appliance Div., East Springfield, Mass.

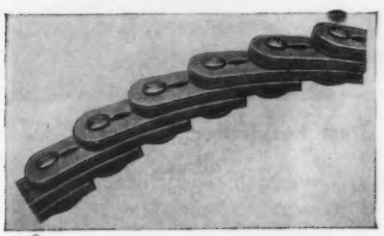
The drier is small—24-ins. high x 14-ins. wide x 19-ins. deep, is portable, can be operated on standard 115 volt a-c service, and needs no plumbing or other permanent installation.

Yet the unit is large enough to dehumidify an enclosed space up to 10,000 cubic feet, it is said. For areas where relative humidity conditions do not require continuous operation of the dehumidifier, a timer clock is available as an accessory.

Stainless Steel Tube Fittings

A new line of corrosion-resistant stainless steel fittings, for Schedule 5 S and 10 S tubing, has just been announced by The Special Screw Products Co., 5445 Dunham Rd., Bedford, Ohio.

Included is a standard selection of elbows, tees, unions and connectors for tubing sizes up to and including ¾", with couplings for larger diameters handled on special order. The new line embodies the self-centering seat designed to insure a leak-proof, wedge-type seal, even though tube is assembled off center. Another exclusive feature, is the reinforcing Teflon rings that double-seal the seat to further guard against costly, dangerous gas or liquid losses.

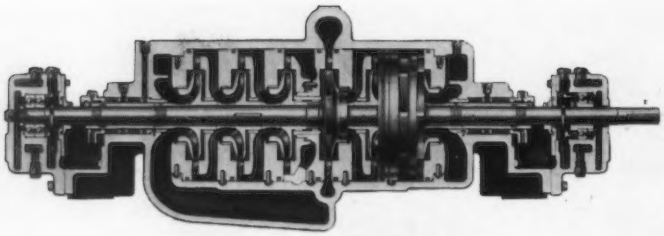


Prestretched Detachable Belt

Introduction of a new, patented, detachable V-Link Belt, that is prestretched, will not slip, can run in either direction, yet costs no more than conventional V-link belts now in use, has been announced by the Brammer Co., 684 Broadway, New York 12, N. Y.

The Brammer V-Link Belt includes design features that prevent distortion after usage and permit smooth vibration-free service at top speeds in either direction. Links contain more plys, are uniform in camber and dimension, and are made from tough-woven cloth impregnated with top grade heat and oil resistant crude rubber.

Another exclusive feature is the convex stud head, designed to assure greater strength and longer service life. Superiority of texture and fit can be readily observed with the naked eye, it is stated. The non-slippage feature is due to high coefficient of friction and a perfected wedge action.



Multi-Stage Centrifugal Pumps

Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y., announces that they have redesigned their line of horizontal, multi-stage centrifugal pumps for medium-pressure applications, incorporating modern hydraulics that give higher efficiency and better operation. These pumps, called the Class CNTA, are intended for boiler-feed, general industrial services to 800 lbs. Built in 1½, 2, 2½ and 3 inch sizes, units are available with 4, 6 or 8 stages.

The Class CNTA pump features a horizontally-split, smooth-bore cylindrical casing which contains the Unit-Type rotor assembly. This assembly is composed of the shaft, impellers, and channel rings, which contain the multiple-volute fluid passages. The entire rotor assembly is quickly and easily removed from and installed in the smooth-bore casing, since there are no mating ring fits or delicate alignment problems. The same interstage sealing method used in higher pressure Class HMTA pumps is used in the CNTA line.

Dust Respirator

The new respirator, announced by Mine Safety Appliances Company, Pittsburgh, Pa., called the Dustfoe No. 55, weighs only 2-¾ ounces, 25 per cent less than previous models. Breathing resistance has been cut in half, with users of pilot models reporting they were "hardly conscious of wearing a respirator."

A 50 per cent reduction in width of the filter holder is designed to eliminate a "blind-spot" area and to increase the downward vision. Construction of the assembly allows for quick changing of filters and easy replacement of parts. The formable aluminum facepiece is readily molded to all normal face contours and the replaceable "tite-seal" face cushion conforms to all facial lines to assure a perfect seal without uncomfortable pressure.

The pre-formed "static web" throw-away filter is made of charged resin-treated felt which creates a static electrical field and supplements the mechanical filtering action by trapping dust particles. The filter holder is of injection-molded nylon, which is noted for its strength, and resistance to heat, abrasion and chemical agents. Bulletin CM-14 is available.

Silastic Tape

Silastic tape is a Class H electrical insulating material with exceptionally high thermal conductivity. A product of Dow Corning Corp., Midland, Mich., its use as insulation permits higher ratings on electrical equipment. In applications where vibration is severe, this tough, resilient material will solve many difficult insulation problems, it is stated.

Silastic R Tape is an easy and convenient way to obtain the heat resistance of Class H insulation plus unusual moistureproofness and flexibility. After being properly cured, this semi-vulcanized, glass cloth reinforced Silastic tape will retain its physical, chemical and dielectric properties at temperatures ranging from — 70° F. to 500° F. At room temperature, its dielectric properties are said to be comparable to those of the best resilient insulating materials, and at high temperatures to be far superior. Silastic also is resistant to lubricating oils and to a variety of chemicals, will not crack or craze on aging, and will retain moistureproofness and high dielectric properties for long periods, the manufacturer claims.

Fortified Rosin Size

A new grade of fortified rosin size for the paper industry is announced by Hercules Powder Co., Paper Makers Chemical Dept., Wilmington, N. J.

Called 'Dry Pexol, Grade 240', the new size was developed for use in unbleached, semibleached, and colored papers and boards. For these papers, it is said to give papermakers not only the usual economies of Pexol fortified sizes but, in addition, the economies of low brightness rosin.

Mills using the fortified rosin size report substantially lower size cost per ton of paper and paperboard, it is stated. The fortified size can be handled with same equipment that is used for conventional sizes.

Sight Flow Indicator

Introduction of the TRIN-VUE Sight Flow Indicator has been announced by Trinity Equipment Corp., 472 Westfield Ave., East, Roselle Park, N. J.

The TRIN-VUE is designed for checking the flow of a fluid in piping systems and for visual examination of the fluid in the line. Two windows located on opposite sides are designed to permit maximum visibility and examination of the fluid. Windows are sealed in the unit by using of O-Ring gaskets and Truarc retaining rings, an innovation of sight glass construction which permits a tight, positive seal, made tighter the greater the pressure or vacuum applied. Since there are no bolts to be adjusted, pressure on the glass is equally distributed, and there are no uneven stresses to cause glass failure or leakage under temperature or pressure changes. A perfect seal at 3 lbs. continues without failure at higher pressures up to 2000 lbs., it is stated.

Features of the TRIN-VUE include its positive seal, light weight, tamper-proof construction, and new type welded design; pressure of vacuum uses do not cause leaks.

Units are available in a range of special materials. Sizes range from ½" to 4".

Remote Weight Recorder

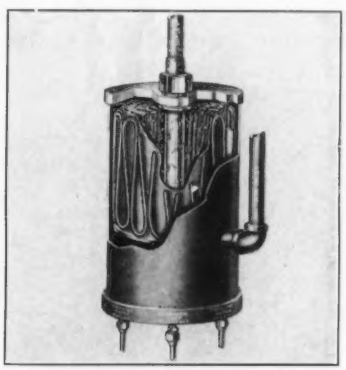
An electronic remote weight recorder is announced by Howe Scale Co., Rutland, Vt.

Known as Teleprint, the instrument is described as a revolutionary and important contribution to increased weighing accuracy. It can be furnished for operation with any of the manufacturer's Tape-Drive Dial Scales. Used with the Unit Weight Cabinet Dial, the unit weights are integrated into the printed record. When used remotely, unit weights can be added

electrically from a switch on the recorder box.

Equipment can be operated with standard electrical components at a distance up to 1,000 feet from the scale, it is stated. Normally, printing action is controlled by push button on control panel of recorder, but can be controlled by other methods to suit various types of operation. Instrument can be mounted on standard portable stand, on a desk, built into dial, or placed to exactly fit user's need. Accuracy is guaranteed to 1/10th of 1 percent of dial chart capacity.

A variety of ticket guides can be furnished: one position guide; two-stop guides for printing gross and tare; universal ticket guide for printing in different columns and on different lines. Prints up to nine distinct duplicates depending on thickness of ticket and type of carbon used. Also has roll-tape adaptation for one or two rolls of tape. A "hold and print" switch can be furnished which will permit either straight "weigh and print" or unlimited repeat printings after load has left the scale. Many types of special applications are possible.

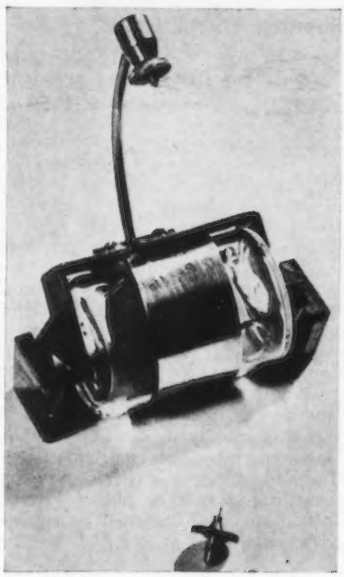


Cartridge-type Filter

A new combination of cooling coil and a cartridge-type filter element to apply in a compressed-air line is announced by Hankison Corp., 282-A Renton Bldg., Pittsburgh 33, Pa.

Known as Condensifilter, it is composed of single unit which measures 9 ins. O.D. by 15 ins. in height, and rates 30 c.f.m. at 100 lbs. It is said to be particularly suited to dry and to remove foreign matter from compressed air for combustion, chemical processing, and other industrial purposes.

Compressed air is connected in the side of housing to fill the chamber surrounding the filter and cooling coil. Cooling-water inlet and outlets are connected at the bottom into coil. Connection also is made to a discharge trap from bottom of housing. Air surrounds the coil and is cooled before moving upward through the annular space between coil and housing, thence down into the filter. Provided in that part of the assembly is about 4 square feet of filtering area made up of five hexagonal and parallel filter chambers, each wrapped with seven layers of canton flannel. Clean dry air issues from pipe connection at center of housing top. Provision is made for removal of filter element so it can be cleaned in immersion in a suitable solvent.



Removable Tip Pen

Industrial instrument pens designed to eliminate flooding and reduce paper plugging and choking are announced by Minneapolis-Honeywell Regulator Co., Brown Instruments Div., Wayne & Windrim Ave., Philadelphia 44, Pa., for their strip chart electronic instruments.

The new pens have removable tips of platinum alloy and a new reservoir construction which eliminates flooding because the effective ink level is always below the writing tip.

Among other advantages claimed are: the pen operates with decreased pressure on the instrument chart, tending to reduce paper fiber choking; thorough cleaning is made easy by a simple disassembly, and the new design fits on standard pen carriages, permitting improved performance for already installed instruments.

Pneumatic Chip Handling System

Conveyair (Pulp Division) Ltd., North Vancouver, B. C., has developed a pneumatic chip handling system which is believed to have overcome difficulties formerly encountered in feeding chips into an air stream.

This new system uses a small amount of air to carry a large volume of chips, which reduces the power requirements and permits a smaller pipe being used. It also eliminates dust and requires a minimum of labor. The system consists of motor blower units, feeder, tubing and discharge and control system.

Equipment of this type was installed at the Harmac mill of MacMillan and Bloedel last year. This unit was designed to take both fir and hemlock chips from trailer units and discharge them into separate silos at a rate of 40 units per hour. The work involved a lift of 70 feet and a horizontal travel of 125 feet.

This system has a 130 hp. power plant. There are four blower units, each driven by a 25 hp. motor, while the feeder unit is driven by a 30 hp. motor. The equipment is housed in a small building and receives the chips from trailer dump by a chain conveyor. The feeder and blowers discharge into a pipe 7¾" in diameter, the pipe being supported by brackets on the side of the silo.

The silo selector unit is placed below the gallery walk on the silo building. Chips are blown directly into either of the silos without the use of large cyclones and without creating dust for interference with other equipment.

Automatic Tail Cutter

The Black-Clawson Co., Hamilton, Ohio, has announced the purchase of exclusive rights to manufacture and sell the New Moody Automatic Tail Cutter.

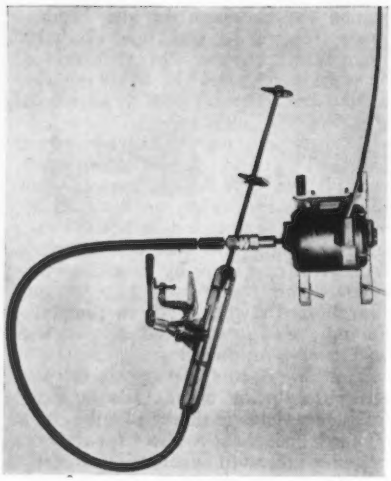
This new and unique tail cutting device is applicable to any paper making machine, and is particularly adaptable to higher speed, wide web tail cutting operations for quick and economical reel starts, itis stated. Electrically operated, and compactly designed, the cutter can be quickly installed at any point along the paper machine. The machine features a high-speed retractable cutting knife which automatically and transversely cuts the sheet for transfer from full to empty reel cores. It can also be installed at the calenders, the dryer section or at any other point where cutting is required.

An outstanding safety device in any mill, the Moody Cutter completely eliminates the hazard of manual web cutting, its foot never slips. The inventor, E. L. Moody, an experienced papermaker of Pensacola, Florida, received the 1951 award for the Best Safety Device introduced to the Paper Industry Safety Contest.

Odor-Less Dampcoat Enamel Color System

A color system devised by the Wilbur & Williams Co., 130 Lincoln St., Boston 35, (Brighton), Mass., in their Odor-Less Dampcoat Enamel permits painting over damp surfaces as well as dry.

Six basic intense colors are the source of intermixing with white and themselves to meet every decorative color scheme making possible 1800 or more tints and colors, it is said. Feature of this color system is that it eliminates any tinting tube or agitant, and merely calls for easy intermixing. Chemically-developed high colors, which in themselves can be used in their own intensity for deep tones, and which intermixed with white, are now capable of meeting all industrial and decorators' color needs.



Portable Mixer

Process Industries Engineers, Inc., 210 Whitfield Bldg., Pittsburgh 6, Pa., announce the development of a new type portable mixer called PIE-FLEX, new mixer is designed with separate motor coupled to the propeller shaft by a flexible drive shart designed for agitator service. Mixer, drive shaft, and motor are easily detached for carrying separately.

Removal of the motor from its customary place at the top end of the propeller shaft, besides reducing the weight by more than half, results in a mixer of simplified design, streamlined and perfectly balanced. Relieved of its topheavy burden, the mixer is much easier to handle, to mount in place and adjust. Adjustment of the angle is facilitated by a lever-operated positioning device by which the mixer can be quickly positioned and locked in place without tools.

The motor, coupled to the mixer by a flexible drive shaft of any desired length within practicable limits, can be mounted at any place to suit the requirements of the mixing job. In the case of hazardous operations, motor can be mounted out of reach of inflammable or explosive vapors, or if necessary, it can be mounted in the adjoining room by running the flexible drive shaft through the wall. No special motor is required—any standard horizontal motor can be used. Thus motors on hand can be utilized.

Mobile Crane Trucks

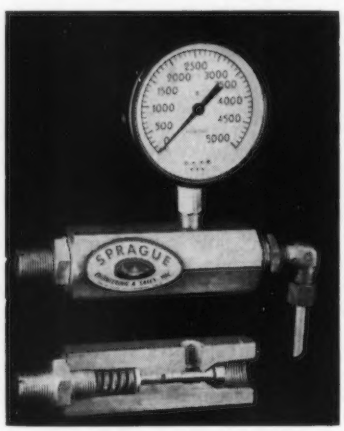
A new line of mobile crane trucks, particularly adapted to handling heavy castings, machinery, bar stock, sheet metal packs and other irregular-shaped material in and out of flat, gondola or box cars, has been announced by Baker Industrial Truck Div. of the Baker-Raulang Co., 1230 West 80th St., Cleveland, Ohio.

With their 19-foot telescoping booms, these units are a valuable tool for locomotive stripping in the repair shop, erection jobs, dock, warehouse and general millwright work. Combining travel, hoist, boom and slew motions in one sturdy compact unit, they also supplement overhead crane equipment by working in areas not served by such equipment. Capacities available are 6000 and 10,000 lbs.

Automatic Tree Planter

Forester John Halpenny, of Cornwall, Ont., has invented an automatic tree planter which is reported to be capable of planting about 1,000 trees an hour. Currently in use in planting large treeless areas in Eastern Ontario, the planter is said to be generally most useful in level, as well as poorly-drained areas. Several hundred thousand trees have been planted by use of such a machine, and it has been found to be satisfactory for conservation purposes due to its inexpensiveness, speed and simplicity of operation.

Equipment is a simple, hydraulic planter which can be raised or lowered by the power lift on the tractor with which it is usually used. The machine is lowered into the sod, parts the earth, and raises a furrow, allowing the seedling trees to be put in. Furrow is then closed and flattened by rubber-tired wheels.



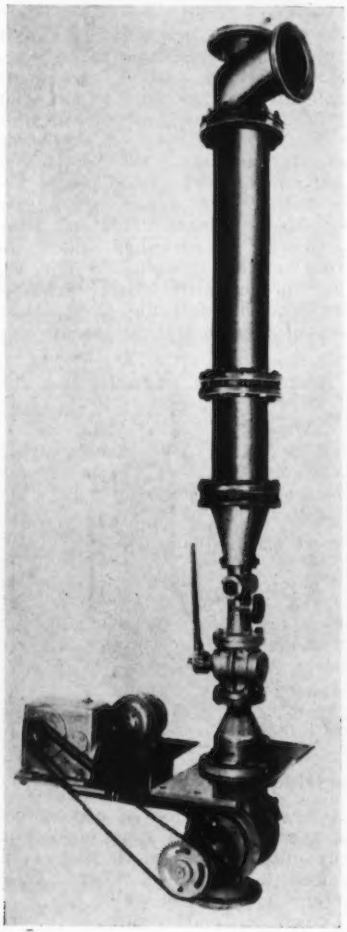
Gauge Shut-Off

Production of a new shut-off valve designed especially to protect gauges in both pneumatic and hydraulic systems is announced by Sprague Engineering & Sales Corp., Gardena, Calif.

Available for low pressure (30, 60, 100, 200 and 300 p.s.i) and high pressure (500, 1000, 1500, 2000, 2500, 3000 and 5000 p.s.i.), the shut-off automatically cuts out gauges from the system when pressure goes beyond their operating limits, thus protecting them from damage. It automatically opens the gauge to the system when the pressure is again within operating range of the gauge.

Positive opening and closing action of the unit is designed to eliminate the need for a relief valve and a manually-operated gauge shut-off valve. A compression spring controls the pressure shut-off point. Minor changes or adjustments may be made by adjusting the screw positioned at one end of the shut off. Major changes of pressure shut-off point are possible by simply replacing the compression spring.

Units are supplied with standard pipe thread connections, but can also be furnished with AN adaptors for aircraft fittings. Connection to the system is made at the end of shut-off, ½″ pipe thread; connection to the gauge is made on the side of shut-off, ¼″ pipe thread.



6" Vortrap For Cleaning Liner Stocks

Nichols Engineering & Research Corp., 70 Pine St., New York 5, N.Y. announces the manufacture of a new 6″ Vortrap, built particularly for cleaning liner stocks for cylinder machines. A further application is for the successful cleaning of de-inking stocks which may contain large quanities of foreign matter.

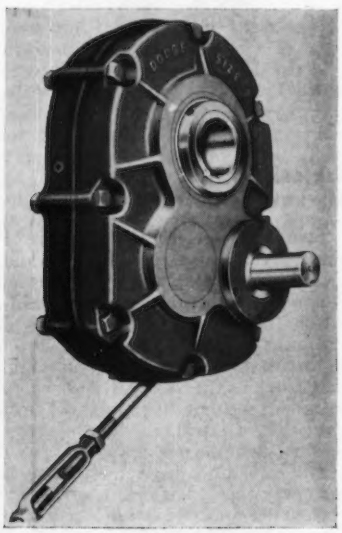
Regular liner stocks range from the best virgin pulps to the poorer grades of baled waste papers. Thus, dirt and foreign matter also will range from small to relatively large volumes. In all cases a good and effective cleaning job is desired, with no plugging difficulties and a minimum of manual care. These are the basic thoughts and considera-

tions behind the design of this 6" Vortrap.

Previously, combinations of 4" Vortraps have been recommended, but such systems require more units, more expense, and more equipment to be effective and, even then, plugging may occur on heavy dirt content stocks. One 6" Vortrap has sufficient capacity to handle the average cylinder machine vat and the installation can be simple and compact. The 6" Vortrap can be furnished for manual or automatic dumping of rejects.

Suggestions for a typical system would include cleaning all of the stock to an individual mould before screening. Thus, one unit would clean up to 25 tons of stock per day and remove the heavy foreign matter before it has contaminated the screen. Screens then would serve to remove fibre bundles, shives, cork and similar light particles for an effective and complete cleaning. Screen capacity can thus be increased appreciably. Such systems can be arranged for complete automatic operation on a continuous 24-hour day basis.

Economies arise from decreased labor for screen wash-ups and increased cycle between necessary shutdowns for general clean-ups; increased production, improved quality, increased wire and felt life.



Shaft-Mounted Speed Reducer

A new double-reduction shaft-mounted speed reducer with capacity to 43 hp, and for output speeds from 12 to 110 r.p.m. has been announced by the Dodge Manufacturing Corporation, Mishawaka, Ind.

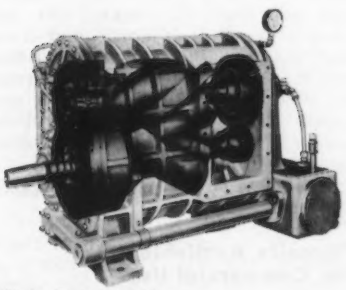
The new No. 7 reducer greatly increases the applications for Dodge Torque-Arm Speed Reducers. Like previously announced models, the No. 7 is shaft-mounted and, anchored with a torque-arm which fastens to any fixed object. A turnbuckle permits fast, easy adjustment of belt tension. Installation is simple and economical. There is no foundation to provide; no flexible couplings are needed.

Dry Film Thickness Gage

The dry film thickness gage is a British product sold through Gardner Laboratory, Inc., Bethesda 14, Md.

Known as the Elcometer Thickness Gage, the instrument permits measurement of non-magnetic protective and decorative coatings applied with an accuracy of ± 5% ± .0001 inch, and offers a wide scope for checking work in process. Measurements are not restricted to flat surfaces. The gage will give accurate readings on small radiused curves—to ⅛" radius on a convex surface. Concave surfaces down to 1" radius, in shallow pressings, can be measured without difficulty, it is stated. Pointer locking device is incorporated in the meter, and the instrument balanced in all planes. Thus a measurement can be taken in the area where scale cannot be seen. The instrument then can be locked and brought into the open for accurate and easy reading. Thickness of foils, leathers, plastics, etc., can be quickly and accurately determined by simply laying the sheeting over a steel plate or table. Completely self-contained and with no dependence on outside source of power, the unit is available for immediate use at all points of operation.

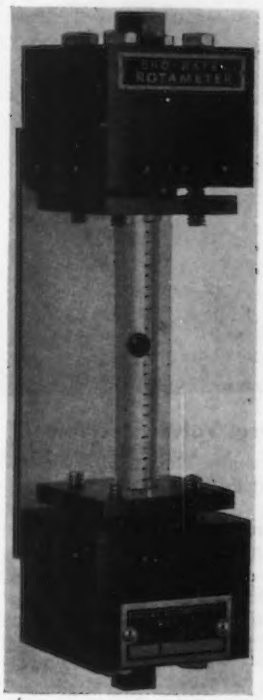
Furnished in scale ranges from 0-2 mils to 0-20 mils, the gages are furnished complete with shims and leather case.



High Output Blower

Known as Standardaire Blower, the product of Read Standard Corp., Blower-Stoker Div., 370 Lexington Ave., New York 17, N. Y., the machine features high output and long life.

An improved axial-flow positive pressure unit, the blower is designed for handling gas or air under pressure or vacuum. Employing an exclusive principle of compressing air on a modified diabatic cycle with lower mean internal pressure, the blower offers a wide range of pressures in a high-speed unit which permits direct drive by standard motors. Through symmetrical generated rotors producing an air-crew effect, air is taken in and discharged smoothly from pockets which form between the rotors. Compression is said to be gradual and free from shock. It may be operated over a wide load range and for a given output, the power consumption is low. A unique oil-sealing arrangement prevents air contamination.



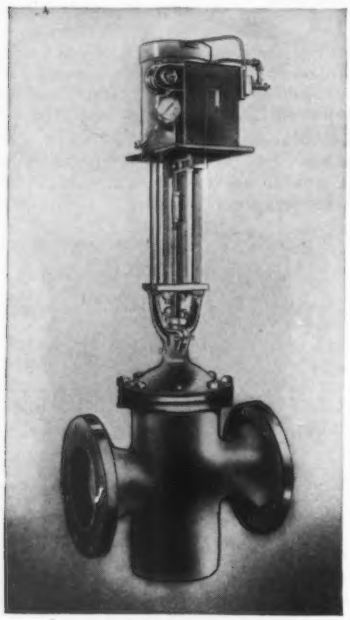
Mite Purge Meter

An acrylic plastic purge meter that eliminates packing glands and glass parts has been developed by the Brooks Rotameter Co., Box 432, Lansdale, Pa.

Known as the Brooks Mite Purge Meter, the unit comes in four sizes with a range of 0.01 to 54.0 g.p.h. of water, and 0.2 to 216 c.f.h. of air. Rate of flow is visibly indicated by the position of a spherical float in the metering tube, replacing bubbler systems. This tube and all piping connections are bored from a block of acrylic plastic. Flow adjustment may be made with a Flo-Mite needle control valve, an optional feature, which may be installed on either the inlet or outlet position of the metering tube.

Two standard models of the Brooks Mite are currently available for metering flows where high accuracy is not required. The model R-2000 meter has etched reference marks for approximate flow indication, while direct flow

readings are made with the model S-2000 meter, which has standard calibrations for either air or water. Both models are safe for pressures up to 100 p.s.i. and maximum working temperature of from 180° to 200°, it is stated. A standard bezel is obtainable for flush panel mounting of either model. Bulletin 120 is available upon request.



Control Valve Assembly

Conoflow Corp., 2100 Arch Street, Philadelphia 3, Pa., and Paul Valve Corp., have collaborated in the development of a complete line of throttling control valves, utilizing Conoflow Pneumatic Cylinder Operators and Paul Venturi Ball Valves.

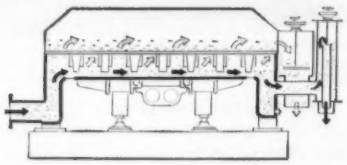
The Paul Valve features a precision-ground ball actuated by the Paul Venturi ball principle. Conoflow operators have been adapted to a number of popular valve bodies to provide for throttling control service. With the combination of these units it is seen possible to greatly simplify many difficult problems involving corrosive fluids, abrasive materials, high temperature and high pressure applications and other difficult services.

Since the Cono-cylinder operator utilizes a positioning mechanism as a component part, the assembly can be used in conjunction with standard pneumatic control instruments for automatic control, or with manual loading stations for remote manual positioning, it is stated.

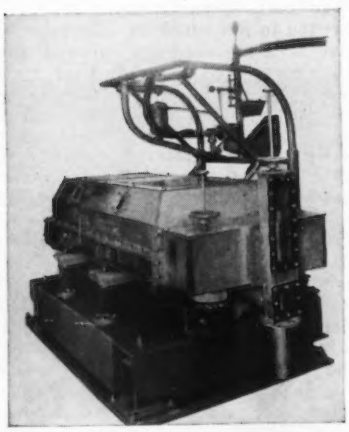
The streamlined venturi passages and smooth-surfaced ball provides a non-turbulent flow stream eliminating cavitation, as well as increasing capacity and improving controllability. Inherently a single-seated valve, the Paul principle reduces unbalanced forces to unusually low values so that the advantage of tight shut-off may be obtained without sacrificing control sensitivity. The straight line relationship between valve lift and flow make the valve suitable for throttling control service. The unit is available in sizes to 8" and in a variety of body materials including iron, steel, stainless' alloys and non-ferrous materials.

Upflow Vibrating Pulp Screen

Recently acquired from Europe, where it has been used extensively in the pulp and paper industry, Oliver United Filters Inc., 33 W. 42nd St., New York 17, N. Y., has further developed for use in the U. S. the Oliver Ahlfors "Upflow" Vibrating Pulp Screen.



Particularly suited for primary and secondary screening of all types of bleached and unbleached pulps, the screen operates with an upward flow,



instead of a downward gravity flow of pulp.

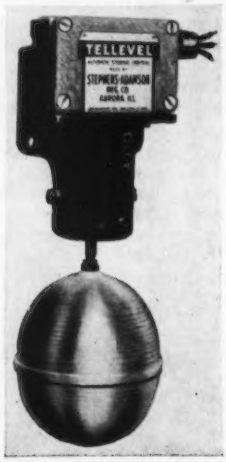
The new development provides the following advantages, the manufacturer claims: (1) high screening capacities because slotted plate screen does not clog; (2) knots, dirt, and other rejects drop down and away from the screening surface rather than onto it; (3) fast, gentle, easily-adjusted vibrations; (4) rejects are constantly discharged at a controllable rate; (5) can operate at much higher pulp consistencies than normal flat screens: less power required, the manufacturer claims.

Pluronics Available For Commercial Use

Increased production of the Pluronics, concurrent with a price reduction, was announced by Wyandotte Chemicals Corp., Wyandotte, Mich. New manufacturing facilities will enable the company to produce adequate quantities of these nonionic detergents to permit their use on a commercial scale.

Based upon use of polyoxypropylene glycols as the hydrophobic unit, this series of 100 percent active agent nonionics includes liquid grades (Pluronics L44, L62 and L64) of uniform viscosity and Pluronic F68 — the first 100 percent active flake nonionic detergent ever commercially produced.

Due to their unusual properties, the Pluronics are reported to have found widespread use in such diversified fields as formulated detergents, textile auxiliaries and specialties, cosmetics, petroleum technology, detergent sanitizers, paper products, and industrial cleaners.



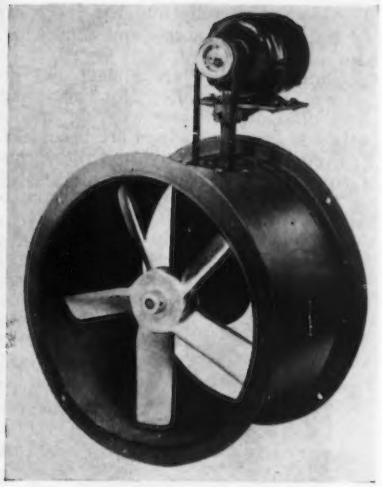
Explosion-Proof Bin-Level Control Switches

Two additions to the line of "Tellevel" Automatic, Bin-Level Control Switches are announced by Stephens-Adamson Mfg. Co., Aurora, Ill. In addition to the normal-duty, heavy-duty and explosion-proof units are now being manufactured to meet special installation conditions. All Tellevels are designed so that a rising, or falling, level of material in bins deflects a pendant float actuating a micro switch.

The explosion-proof unit is designed for operation in hazardous areas where explosive vapors and dust occur. It is approved by the Underwriter's Laboratory for various classifications, including vapors and dust from such materials as ethyl ether, gasoline, alcohol, acetone, coal, etc.

Where materials, such as coal, with lump sizes above ¾" are being discharged to bins, the heavy-duty switch is designed. This unit is furnished with a sturdy steel housing protecting the switch mechanism and the standard plastic float ball is replaced by a steel cone. A rubber cup at the base of the housing forms a dust and moisture proof seal to protect the switch mechanism.

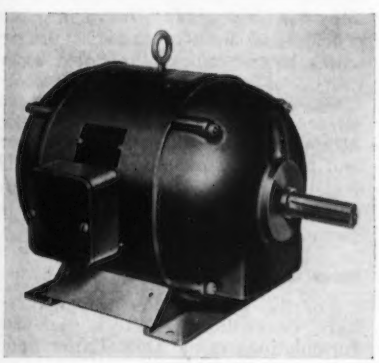
Write the manufacturer at Aurora, Ill., Los Angeles, Calif., or Belleville, Ont. for copy of Bulletin 11-O.



Explosion-Proof Exhaust Fan

For exhausting dangerous or obnoxious fumes, dirt, heat and smoke and other applications where it is desirable to have the motor outside the air stream, Standard Electric Co., Inc., West Berlin, N. J., has brought out a general purpose type fan combining a number of improvements.

Explosion proof, enclosed or open type motors are available in capacities up to 30,500 c.f.m. free delivery as required and this rugged unit meets UL specifications for spray booths. eFatures include sealed SKF bearings in readily replaceable flange construction, double-angle motor support to minimize vibration, adjustable motor base for belt takeup, and heavy cast aluminum fan blade in a wide range of sizes from 18″ to 42″. From ¼ to 7½ hp. motors are also available as required.



All Weather Motors Include 125 hp. Ratings

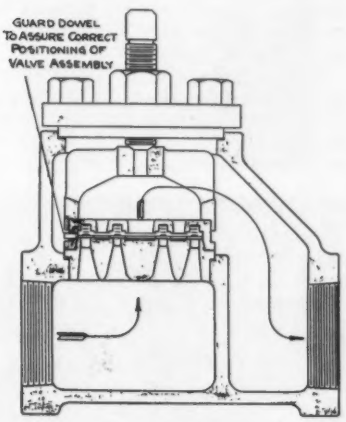
The Industrial Motor Division of Robbins & Myers, Inc., Springfield 99, Ohio, announces the addition of four new frame sizes, expanding its line of standard motors to include 125 hp. ratings. The highest previous R & M rating has been 50 h.p.

The four new sizes are designed for all-weather operation, with special treatment to resist moisture and corrosion. All steel parts have a baked-on, rust-resisting undercoating known as "Robbinite."

Rotor assembly is treated with a special rust-inhibitor and the cast-iron end-heads and terminal box are cleaned and given an anti-corrosion treatment of zinc chromate. Power lead-ins are sealed at the motor shell with a non-hardening compound.

Featured also are extra-wide, prelubricated ball bearings containing special laboratory-tested greases to resist the adverse conditions of dust, temperature, humidity, and speed; extra insulation between each coil; end-to-end "clean sweep" ventilation designed to eliminate converging dirt-depositing air currents.

The four new ratings will be made in NEMA frames 444, 445, 504 and 505.



Automatic Aircheck Valve

An automatic aircheck valve for installation on discharge line of air and gas compressors is announced by Pennsylvania Pump & Compressor Co., Easton, Pa.

Held to be a notable advance in compresser operation, the PPC Aircheck Valve is designed as a safeguard against failure to open a valve when starting up. Advantages claimed for its installation on the discharge line are: (1) it dispenses with customary arrangement of stop, safety, and glove valves; (2) prevents leakage of pressure through the compressor during the "off" cycle; (3) dampens pipe line pulsations; (4) repairs without shutting down the system where more than one compressor is on the line. Further described in Bulletin 509-A.

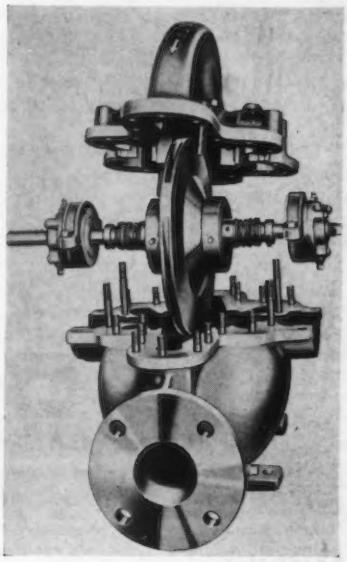
Chlorine Vaporizer

A steel chlorine vaporizer which converts liquid chlorine to dry vapor is announced by Whitlock Manufacturing Co., 42 South St., Elmwood, Hartford 2, Conn.

Designed to provide high output at low equipment cost, the Whitlock Vaporizer is recommended by the manufacturer for use in pulp and textile mills, in industrial processes, in water, sewage and industrial waste plants, or wherever relatively large quantities of chlorine are required.

Extremely efficient, this unit will vaporize up to one ton of chlorine per hour with minimum steam consumption. Due to its simple design and heavy, all-steel construction, the Vaporizer combines convenience of operation with low first cost and economy of maintenance, it is stated.

Write to manufacturer for Bulletin 132.



Improved Water Pump

The use of standard mechanical shaft seals, instead of conventional stuffing boxes, is the outstanding feature of a new line of horizontal, split-case, general service pumps announced by Peerless Pump Div., Food Machinery and Chemical Corp., 301 West Avenue 26, Los Angeles 31, Calif.

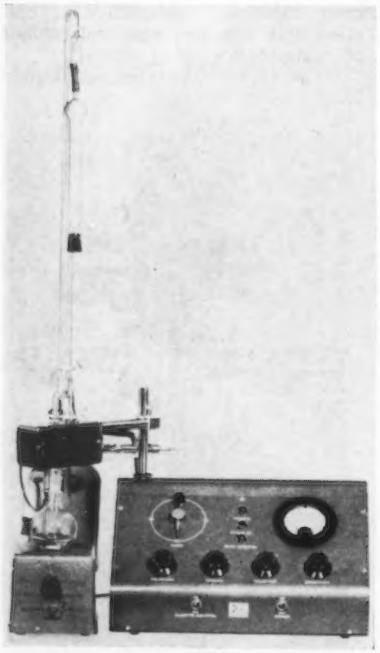
Designated Peerless Type AS, the line of pumps is available in discharge sizes from 1½″ through 4″. Capacity range is up to 750 gpm and head range is up to 230 feet. General application is for pumping water and clear liquids up to 200°F. where no solids are in suspension.

By use of standard mechanical shaft seals, instead of conventional stuffing boxes, the manufacturer states that the pump shaft of the Type AS pump is shortened to ½ the length of shafts in conventional pumps of the same size, the shaft is more rigid and shaft deflection is materially reduced, resulting in smoother, quieter operation and substantially longer life for bearings, seals and wearing surfaces.

In addition, the use of seals has eliminated stuffing box housings; thus the pump occupies approximately ½ the floor space usually required by general purpose pumps of the same size. Benefits from reduced size include better accessibility, lowered constructor costs. Several points higher

efficiency has been attained the manufacturer declares, without sacrificing any of the basic design features required in a premium quality pump.

Request Bulletin B-1350.

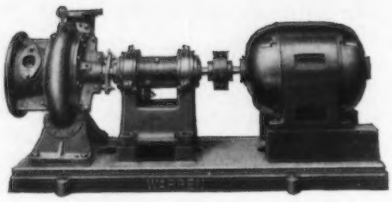


Aquameter

Beckman Instruments, Inc., South Pasadena, Calif. announces a new type of instrument which automatically measures the water content of products.

Known as the Aquameter, the instrument permits such determinations to be made with maximum convenience, accuracy and simplicity, it is stated. The unit uses the Karl Fischer technique, thus eliminating errors caused by temperature effects, oxidation and decomposition such as are introduced by oven-drying procedures.

Basically, the instrument consists of an electrically controlled titrating unit into which the sample is introduced. A knob on the Control Unit is then set and the instrument completes the titration automatically without further attention from the operator. Normally, only one to two minutes are said to be required for a complete determination and, since the instrument is completely automatic in operation, the technician is free during the titration to perform other operations, such as preparing samples or tabulating results. Another important advantage claimed is that the Aquameter assures greater accuracy by eliminating the color-judging factors necessary in conventional Karl Fischer methods. Operates on standard 115 volt, 50-60 cycle a-c circuits and utilizes the "dead stop" technique recommended by the U.S. Pharmacopeia.

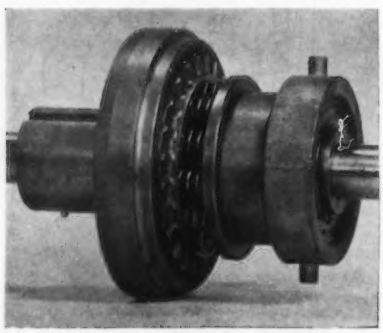


Improved Stock Pump

A stock pump of improved construction is announced by Warren Steam Pump Co. Inc., Warren, Mass.

Design of the new unit—known as Type SOD—provides an arrangement to reduce the clearance between impeller and suction liner by means of an adjustment screw. Inevitable wear normally increases this clearance, reducing capacity, head and efficiency. The improvement results in much less frequent replacement of liners, the manufacturer claims.

Another feature is the availability of five different impellers, each designed specifically for five different operating services; yet all fit the same size and type of pump.



Adjustable While Running Slip Clutch

The Hilliard Corp. of Elmira, N. Y. announces that its line of slip-type clutches has recently been redesigned and improved, and an adjustable-while-running slip clutch added. The new clutch is designed for use in winding and reeling applications where it is necessary to change the torque transmission gradually and maintain constant tension while the operation progresses.

Another application is in the drive of high inertia machines where overload protection is desired. For example, mixing machines sometimes need extra power to break away and start the mechanism, but the load drops considerably after motion is started. With the adjustable-while-running clutch, the lever can be moved to provide high torque for starting and then return to the lower regular run position. If a jam occurs, the clutch will slip to eliminate damage from the overload.

On the new clutch, a ball-bearing sliding collar replaces the regular adjusting nut. The customer furnishes a yoke and lever to connect with the lugs on the collar. Full control of the clutch is obtained thereby and the lever can be equipped with screw and hand wheel for fine adjustment, it is stated.

Clutch castings are ribbed and the sleeve web ventilated for maximum heat dissipation. Long wearing molded asbestos friction facings are used. Several models are offered and the torque ratings and heat capacity are described in Hilliard Bulletin 300.

Emergency Light

A new Watchmaster Automatic Stand-By Light with glass jar rechargeable battery and visible ball float hydrometer is offered for immediate delivery by Carpenter Mfg. Co., Somerville, Boston 45, Mass. It supplies emergency light instantly when fuses blow or power failures occur.

Electrical components—including relays, transformers and battery chargers—have been specially engineered for constantly energized stand-by duty. The battery has heavy pure lead plates, hard rubber separators, patented leakproof terminals and automatic filling control. Built-in trickle charger maintains specific gravity between emergencies and built-in fast charger restores battery quickly for next emergency.

Choice of floodlights or sealed beam lamp heads and either condulet connection for permanent wiring or cord and plug attachment for semi-portable installation. Lamp heads are removable, and extra heads are available, for remote mounting. U/L pproved.

New Coating Method

For the paper maker who may not have conventional coaters, size-press formulations using Dow Latex 512-K permit the manufacture of a new line of paper without modification of existing equipment or investment in special coating equipment, according to Dow Chemical Co., Midland, Mich.

Commercial runs have proved that the new coating method gives a brighter, smoother and more opaque sheet in the same cost range as traditional sized coatings, it is said. Because of the thermoplastic nature of Dow Latex 512-K, supercalendering gives the sheet improved smoothness, permitting more faithful reproduction of printing and better lacquer and

varnish hold-out. In addition, the use of Dow Latex 512-K in a pigmented size press coated paper also contributes improved wet rub resistance, flexibility and other physical property improvements.

Heretofore, the size press has been used almost exclusively for applying a pure starch sizing for the purpose of laying down the fibers in order to produce a smoother printing surface. Occasionally clay was used with the starch. Papers coated at the size press with this latex adhesive open market possibilities for book papers, offset papers, high quality conversion - coating base stock, and label and packaging base papers requiring good lacquer and varnish hold-out, it is stated.

Adhesive for Silicone-Treated

Silicone coated surfaces can now be strongly adhered with a new adhesive developed by Polymer Industries, Inc., Astoria, N. Y. Interest in this new adhesive is greatly because silicone finishes were hitherto among the most difficult of all surfaces to adhere. In fact, such coatings were noted for their extreme "oiliness" and "non-sticking" properties. Many of the widespread uses for silicone coatings are based on this characteristic, which is related to their great resistance to being wetted.

Among he remarkable features of Weld," is that it functions in high-this new adhesive, known as "Glas-speed gluing machines fully as well as the best standard adhesives. Even in the fastest bottle labeling, caron sealing, bag making and other gluing machines, the Glas-Weld adhesives have been successfully operated on a commercial basis, it is claimed.

Silicone coated paper, wood, ceramics, and metals have also been successfully adhered with this new line of adhesives. The tremendous possibilities inherent in such finishes are no longer being held back through lack of suitable adhesives for the fabrication of bags, cartons, fiber boxes, and cans.

Further information on the Glas-Weld adhesives is available from Polymer Industries at its main office, 11-08 30th Avenue, Astoria, N. Y.; from the branch plant at 284 Sheffield Avenue, Brooklyn, N. Y.; and from Polymer Southern, Inc., Box 2184, Grenville, S. C.

Giant Fog Nozzle for Large Fires

A new giant-size fog nozzle made especially to combat large fires in or out-of-doors has just been announced by the manufacturer, Bete Fog Nozzle Inc., Greenfield, Mass.

Called Bete Giant Model 500 Fog Nozzle, the new nozzle delivers a 500 g.p.m. fog blanket with a large diameter of coverage and an effective reach of approximately 80 feet, according to the manufacturer. It is claimed that the tremendous cooling effect of this large volume of fog will almost instantly extinguish large flammable liquid fires, as well as wood, paint, and other types of hot fires.

Made with 2½" National Standard Thread connection, the new Bete nozzle can be attached direcly to a hose or turret gun having this thread, in place of the conventional straight stream nozzle. A unique feature of the Bete nozzle is its spiral atomizing element which contains no small orifices or internal parts. Small stones, bits of hose, washers, or other foreign matter pass freely hrough the nozzle without clogging. Made entirely of bronze, the new nozzle has external vanes for added strength in rough service.

Hub-Type Grinding Wheel

Norton Co., Worcester 6, Mass., announces a new reinforced, flexible, hub-type grinding wheel known as the Norton BFR wheel. ("B"—standard marking for resinoid, "F"—fibre construction, "R""—reinforced). With the BFR, an operator can now rough grind, finish grind, and notch—all with the same wheel.

Designed for use on "right angle" or "sander" type portable grinders, this wheel is made of carded web material impregnated with abrasive grain. It is light, possesses unusual strength due to patented construction, is sufficiently flexible to permit blending of contours, and does a good polishing job.

Generally, the new BFR wheel will be used to smooth down welds, blend surfaces on contours, and notch risers in all kinds of castings.

Unusual strength is achieved by a safety web built into the back of the wheel. Should breakage occur, the web is designed to hold pieces together until the machine can be stopped. Both the BD and BFR hub-type wheels have contributed immeasurably to operator safety.

Liquid Stainless Steel

Liquid Stainless Steel is a combination of actual stainless steel reduced by a new process to a microscopically fine form and combined with vinyl plastic to form a quick-drying liquid that will give a protective coating to metals, wood, composition board, concrete, brick, plaster-board or plastics. Manufactured by Lockrey-Fater Corp., Long Island City, N. Y., it offers impermeability to moisture of type 18/8 No. 302 stainless steel in an easy-to-apply form.

The metal is present in the form of flakes which overlap and interlock as coating dries, presenting an almost continuous barrier of stainless steel to corrosive materials.

Material can be sprayed, brushed or dipped. Good results are said to have resulted by applying the product directly over severely rusted parts. Best results are obtained when surface is clean. Dries tack-free in five minutes; reaches maximum hardness and chemical resistance in 48 hours at room temperature; and may be baked for one hour at 200° F.

For the coating of castiron frames and other parts exposed to the action of chemicals and water, or for protection against weather, salt atmosphere, or abrasive wear, an application is held to be sound economy.

Rust Inhibiting Metal Cleaner

Pennsalt EC-51, a new rust-inhibiting organic-type metal cleaner, has been announced by the Pennsylanvia Salt Manufacturing Co., 1000 Widener Bldg., Philadelphia 7, Pa.

Newest addition to the line of emulsion cleaners by the metal industry for many years, the new product is said to combine powerful detergent action with a high degree of rust protection. It also has proven highly successful in cleaning prior to painting.

Steel parts obtain protection from rusting for up to six weeks under normal plant conditions. Even under unfavorable conditions, protection for two or three days can be expected. The new cleaner is equally efficient in removing soil from all of the nonferrous metals without staining or etching, the manufacturer stated.

Used in concentrated or diluted form and can be applied by both spray and immersion methods, the new cleaner is non-caustic, non-explosive, harmless to the hands and does not create toxic working conditions.

Chemical Feed Packaged Unit

A new chemical feed packaged unit which delivers liquids in desired amounts under pressure is announced by Bird-Archer Co., 4337 N. American St., Pniladelphia, Pa. today.

This self-contained, extra-heavy Baco unit offers high-pressure controlled feed at low cost. Chemical reservoir tank of welded steel construction is available in 50 or 100 gallon capacity. The chemical proportioning pump can be developed for various rates of feed at different pressures. It is mounted below the tank to minimize air binding and to maintain a positive suction head. A specially-designed motor-driven agitator assures completely mixed fluids at all times. Stainless steel strainer is provided between the suction side of the pump and the tank.

A duplex-pump model with divided tank is also available. Both types of units are supplied complete with all necessary piping and are ready for connection. Bulletin 52 giving complete data is free on request.

Air Conditioning Unit

A new Unitaire air-conditioner, the MU-101 is available from the Air Conditioning Div. of the Westinghouse Electric Corp., 200 Readville St., Hyde Park, Boston 36, Mass.

Two 12-inch, double inlet fans nominally deliver 4000 cubic feet of air per minute. Fan section, which can be mounted either on top of the cooling section or at the side, can be rotated to give six different discharge arrangements when it is top-mounted. When mounted at the side, five additional arrangements become available, permitting adapation of this unit to any type installation.

Self contained in a gray-finished cabinet, which is thermal and sound insulated with glass fibre and aluminum foil, this 10 H.P. unit is 91″ high when top mounted, and 61″ by 32″ at the base, making it suitable for fitting into recesses to save floor space. In its side-mounted arrangement it is only 62″ high.

Adaptability is provided by accessory heating coils, and unit control is provided by a control board with a selector switch and thermostat adjusting knobs. Other accessories include inlet and discharge air grilles, filters, a water regulating value, and a discharge plenum chamber.

Matched Absorption Cells

Beckman Instruments Inc., South Pasadena 16, Calif. has perfected a method of producing matched 10mm Pyrex Absorption Cells for its Model B and Model DU Spectrophotometers.

These new Pyrex Cells feature optically-polished outer surfaces and are said to be the only matched cells available at a low price. All cells in a single shipment are matched within 3 percent transmission at 320 millimicrons; the light path length of each individual cell is held to an accuracy of ± 0.025mm; and each is individually tested under conditions exactly duplicating actual spectrophotometric procedures.

The manufacturer recommended for all applications in the range of 320 to 1000 millimicrons where the critical matching tolerance of the Corex type cells is not required.

Available from any authorized Beckman Instrument dealer, or complete information can be obtained by writing to the manufacturer.

Dye Stripping Agent

Antara Chemicals Division of General Dyestuff Corp., 435 Hudson St., New York 14, N. Y., announces commercial availability of Peregal ST, a new and effective stripping agent for vat, sulphur and direct dyeings.

As a weekly cationic material, the product is said to form very stable cation-anion complexes with dyestuffs containing sulfo groups, or phenolate groups in aqueous solution. In stripping operations, once the fiber-dyestuff bond is broken, the dislodged dye is preferentially bound to the Peregal ST, for which it has greater affinity than for cellulose. Even after prolonged treatment this equilibrium cannot be shifted toward dyestuff-on-cotton.

Samples and information can be secured from the company.

Super Concrete Bins

Characteristic feature of the new storage bins is the Super-Concrete Stave with diagonal ends. The product of Neff & Fry Co., 163 E. Central Ave., Camden, Ohio, and made of artificial stone described as rocklike concrete, the staves are guaranteed by the manufacturer to have 5,000 p.s.i. crushing strength after 28 days.

Formed of ideal deposits of sand and gravel and highest quality cement mixed with pure water to exact formula, the concrete is molded under great hydraulic pressure of approximately 140 tons, and the staves finally cured to effect complete crystalization.

Visible evidence of the load-bearing ability of the silos is seen in installations where superstructures and machines are mounted on them without extra supports, proving the claim to "the strength of pillars."

Pictured is a new installation of four 30′ x 60′ chip silos at Chesapeake Corp., West Point, Va.

Due to the density of the concrete, the walls are said to remain dry enough for the storage of most flowable bulk materials. When absolute imperviousness is required, waterproofing can be provided, also staves of special design.

Write for folder, "Bins With the Strength of Pillars."

Indicating Pyrometer Controller

A compact, direct reading, indicating pyrometer controller incorporating a built-in unit to provide straight-line control is being offered by Wheelco Instruments Co., 847 West Harrison St., Chicago, Ill.

Known as Model 293 Capacitrol, this is an economical on-off type controller using the same measuring system with Alnico V Magnet and control assembly utilized in its predecessor Model 292, but with the further advantage of being able to compensate for the transfer lags inherent in all heat processing or process control systems.

Size of the instrument is 7⅝″ wide x 8⅛″ high x 7 25/32″ deep. A wide range of standard scales in various thermocouple calibrations are available. Capacitrol features, such as Thermocouple Break Protection, interchangeable voltage selector plugs, front accessibility, and plug-in terminal panel, have been retained in the new Model 293.

Magnesium Cement Flooring

The combination of magnesium chloride and magnesium oxide with certain fillers and fine aggregates is said to produce a cement that sets within a few hours to form a hard, dense, durable mass with excellent characteristics as a flooring material.

Marketed under the trade name Magna-Crete by Flash-Stone Company Inc., 3723 Pulaski Ave., Philadelphia 40, Pa., this type of cement is composed of carefully selected and correctly balanced hard-rock fractures bedded in a matrix of mineral and vegetable fibres, is supplied in dry form to be mixed on the job to a mortar consistency, then spread, leveled and finished by troweling.

Among the advantages claimed for the product are its comparatively light weight, good bonding qualities, resistance to oils and greases, granite hard surface, silence, moderate price range, high structural strength, long life and low maintenance cost. For bulletin with complete description write to Flash-Stone Co.

1000-Watt Fluorescent Mercury Lamp

To meet the trend toward larger manufacturing spaces, higher mountings and higher lighting levels both indoors and outdoors, Westinghouse Electric Corp., Lamp Div., Bloomfield, N. J., has made available a new 1000-watt, C-H12 fluorescent mercury lamp.

Similar to the 400-watt J-H1 fluorescent mercury lamp, this new light source provides a golden white light suitable for all types of lighting service except those where close color discrimination is involved. Its ballast is the same as that used for the 1000-watt, A-H12 lamp, and its BT-56 bulb has a specially developed isothermal shape that allows the phosphor coating to function at maximum efficiency.

When activated by invisible ultraviolet light from the quartz arc, the phosphor gives off red light. This blends with the blue-green-white light from the mercury arc to give a golden white light with approximately the same color quality as a mixture of equal wattages of mercury and incandescent light. Inside frosting of the bulb provides better diffusion of light and greater uniformity of color.

When used outdoors, fixtures should be designed to protect the bulb from a driving rain or moisture-laden insects.

Deposit Films With Non-Blocking Properties

To meet the demands of the paper industry for a polyvinyl acetate copolymer solution which deposits films with *non-blocking* characteristics, the American Polymer Corp. of Peabody, Mass. has developed Polyco 408.

This new product deposits films described as tough, glossy, scuff-resistant, water- and grease-resistant, heat sealable and possessing *non-blocking* properties. Pressure tests of 1 p.s.i. at 120°F and at a relative humidity of 78% show no evidence of face-to-face blocking, it is claimed.

The solution can be reduced to a solids content of 45% with ethyl alcohol without causing precipitation of the copolymer; it is soluble in all proportions with ethyl acetate and acetone; does not require fusion to achieve good adhesion, gloss and any of its other properties. However, higher temperature heating for one or two minutes improves adhesion on less porous surfaces. It can also be modified; and can be copolymerized in other solvents to meet your requirements and specifications. Write the manufacturer for data sheet No. P-36.

Hydraulic Drum Up-Ender

An economical hydraulic drum upender attachment which permits fork truck operators to pick up, transport, stack and empty heavy drums without leaving their seat, has been developed by Baker-Raulang Co., Baker Industrial Truck Div., 1250 West 80th St., Cleveland, Ohio. Drums can be rotated 90 degrees for vertical or horizontal stacking, or tilted 45 degrees *below* horizontal for emptying at any height within the lift range of the truck.

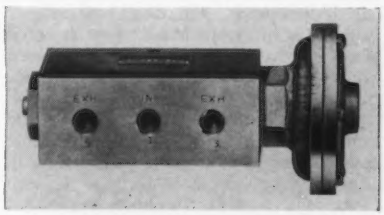
The attachment consists of shoes which are pinned with two lock pins to the forks of the Baker 4-purpose carriage. Mounted on the shoes are pivoted rubber-faced grab plates which clamp around the drum and hold it firm. The up-ending operation is accomplished thru a hydraulic cylinder mounted on one of the shoes. Operation of the hydraulic cylinder builds up pressure in an actuating accumulator mounted above it, which is used to return the drum to an upright position.

In addition to quick-demounting feature, an important advantage claimed is that the operator maintains complete control from his seat. Clamp and tilt controls are dash-mounted at his left for convenience. Both the 4-purpose carriage and the hydraulic up-ender can be mounted on 2000, 3000 and 4000 lb. Baker fork trucks.

Tailored Dextrins

National Starch Products Inc., 270 Madison Ave., New York 16, N. Y. is now "tailoring" dextrins to fit the special needs of individual paper manufacturers. These custom-made dextrins are available for use in high solids machine coating and all types of off-machine coating.

Properties of the dextrins which will be modified according to the user's specifications include viscosity range, color, thixotropy, and compatability with various additives.



Diaphragm Valve

Introduced by C. B. Hunt & Son, Inc., Salem, Ohio, the Quick-As-Wink diaphragm-operated spring-return single plunger valve is for use when only low pressure air is available for the pilot control. These valves can be operated with instrument air at pressures of from 12 to 35 p.s.i. on the diaphragm, consequently are suited for use in laboratories and on all types of industrial applications where only low pressure air for the pilot control is available.

Low in price, they feature sturdy construction; simplicity in design; ease of operation. All parts are carefully balanced. Valve housing is aluminum. Stainless steel plunger is hollow with precision placed radial ports. The spring return is placed under the diaphragm push plate permitting open end exhaust if desired. The manufacturer reports that the improved design prolongs the life of the packing and valve parts, and that the valves can be completely disassembled and reassembled in a few minutes without disturbing the main piping.

Furnished tapped for either ⅛" or ¼" pipe connection, in 2-way; 3-way; double 2-way; 4-way; and 5-way designs for use with air, oil or water at line pressures up to 125 p.s.i., also vacuum at normal temperatures, (not exceeding 150° F.).

Water Treatment

N-Sol Processes (activated silica sol) have been introduced by Philadelphia Quartz Co., Public Ledger Bldg., 6th and Chestnut Sts., Philadelphia 6, Pa., as coagulant aids in clarification of raw and waste waters.

Involved in the processes are various methods of preparing the sol with N* Silicate of Soda and a reacting chemical such as ammonium sulphate, alum, chlorine, sodium bicarbonate. According to the manufacturer, use of the sol speeds the formation, size, density and strength of the floc which enmeshes suspended materials and settles rapidly, removing greater quantities of impurities.

The company holds several patents on the processes and licenses are granted to users without royalty fee. Descriptive bulletin (52-19) is available.

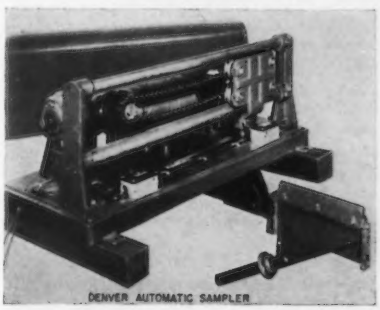
*Registered trademark

Special Paper Bag Calculating Instrument

A special paper bag model of the Paper Equivalentor is available from Ralph Landenberger, 327 So. La Salle St., Chicago, Ill.

An adaptation of the original instrument which is designed to solve problems in equivalents, the bag model has two special red marginal scales by means of which the weight per thousand of rectangular bag blanks my be determined with ease, basis 24x36, either 480 count or 500 count.

In construction, it consists of two discs, approximately 7" and 6" in diameter superimposed, and with a third member, a radial scale or runner, all permanentlv attached with special pivotal assembly. By means of the diagonally radial lines of the smaller disc, which register on the runner scale, a wide range of numbers may be registered. The radial lines register the third figure of answer in all figures over 100, and fractions in figures under 100.



DENVER AUTOMATIC SAMPLER

Automatic Sampler

Denver Equipment Co., 1400 17th St., P. O. Box 5268, Denver 17, Colo. has acquired exclusive manufacturing and sales rights to the Automatic Sampler formerly known as the Deco SL sampler and produced by the Heginbotham Equipment Co., Salt Lake City, Utah.

The unit, to be known as the Denver Automatic Sampler, has been tested in mill operations and has proven valuable in obtaining accurate wet or dry sample cuts, the company states.

Design improvements announced are: (1) Sliding contact has been replaced by carriage assembly on ball bearing rollers; (2) the cutter, with standard travel of either 16" or 21", is actuated by means of a positive chain and sprocket drive; (3) driving unit is a gearmotor operating at intermittent intervals; (4) a limit switch shuts off the motor at the limits of cutter travel; (5) the time switch reactivates the mechanism according to the established sampling cycle; (6) overtravel of the cutter is prevented by a magnetic-operated brake on the end of the motor shaft.

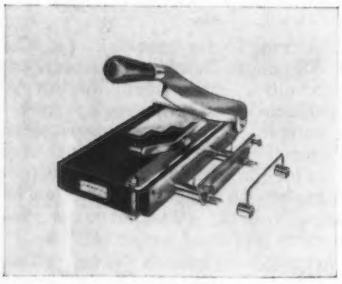
A manually-operated switch can be used to operate the cutter at other than its set time cycle. Cutter travel speed is fixed at 7½" per second.

All Purpose Roll Coater

The new all purpose roll coating unit was developed to meet the coating requirements of many mills. According to the manufacturer, John Waldron Corp., P.O. Box 791, New Brunswick, N. J., its design permits a wide variety of coating, impregnating and laminating operations.

Priced according to specifications depending on web width and coating arrangement, the machine will handle all types of film forming materials in dispersions, emulsions or solutions. It can be adapted to sheet coating or to continuous web coating of paper, textiles, plastic films, foils, etc.

Among the many uses for which it may be considered are: laminating adhesives to paper; coating of paper; impregnation; application of heat sealing adhesives.



Precision Strip Cutter

The Precision Strip Cutter produced by W. & L. E. Gurley, Troy, N. Y., is designed to facilitate the cutting of material samples into various lengths and widths.

It provides an extra heavy precision-ground blade and bedplate mounted on a sturdy hardwood board. A clamping bar holds the material during cutting. Templates and easily adjustable guide bars insure the cutting of exactly dimensioned samples essential to accurate tests, it is stated.

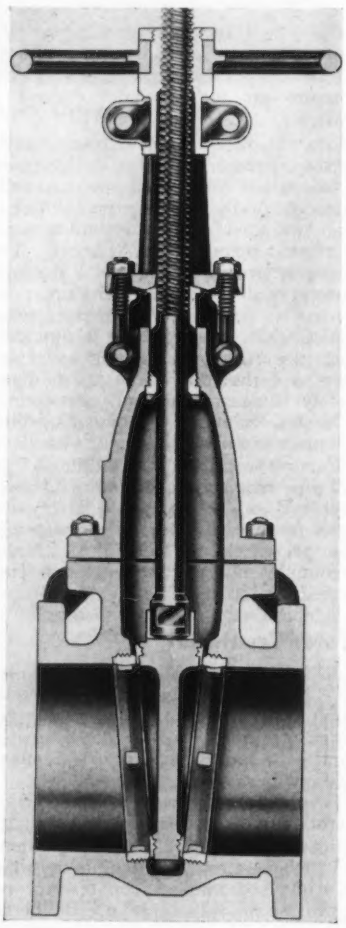
Lemol Polyvinyl Alcohol

From the large number of possible combinations of viscosity and degree of hydrolysis, American Monomer Corp., Leominster, Mass., has selected six standardized and widely used grades of polyvinyl alcohol for manufacture under the trade name Lemol.

According to the manufacturer, the Lemols provide tough, water soluble resins combining high tensile strength, adhesiveness and tear resistance with extreme inertness to aging, oxidation and bacterial action.

Roughly speaking, they are broken down into two groups: completely hydrolyzed and partially hydrolized, and are available in high, medium and low viscosity.

Complete data furnished gratis by manufacturer.



Solid Gate Wedge Valve

OIC 125 p.s.i. iron body, solid wedge gate valves with 13% chrome stainless steel trim are announced for use in pulp and paper mill service by Ohio Injector Co., Wadsworth, Ohio.

Available in sizes 2″ through 16″, they are designed for handling alkaline liquors of various kinds where standard iron or bronze trim valves would fail due to highly corrosive or otherwise harmful line fluids. Can also be had with 18-8 stainless steel or monel trim.

Protective Coatings for Casein Storage

Mixing and storage tanks for casein solutions with pH values of seven and higher can now be protected against corrosion with Lankote 400 series coatings, according to J. Landau Co., 221 Wooster St., New York 12, N. Y.

Lankote 400 series coatings are held to be excellent under constant immersion conditions for a wide variety of alkaline, water, acid and salt solutions. They are supplied in nine stock colors and can also be applied to concrete and masonry.

Literature and samples are available from Lankote Division, J. Laudau Co., 221 Wooster St., New York 12, N. Y.

Speedy Ink Changes

Development of a new solvent which permits a change from black to yellow in 10 minutes of wash-up time is announced by Harry H. Rogers Co., Inc., 5331 South Cicero Ave., Chicago 32, Ill.

Named Rogersol 1-2-3, the solvent is suited for offset presses, or any press that has a washer blade, and is said to test to complete removal of every bit of color run on a set of rollers and to leave them looking like new.

Each of the three solvents used in the product has a high flash and meets with fire law specifications. The product is not harmful to metal, rubber (glue-glycerine rollers excepted), to hands or eyes, and is not toxic, the manufacturer claims, who states that the product is a boon to lithographers.

Brazing-Alloy

A new copper-phosphorous-silver alloy, Phos-Silver®, for efficient brazing of copper, brass and bronze is available from the Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa. Extreme fluidity and good wetting properties enable this new alloy to penetrate tight-fitting joints instantly to form strong ductile bonds, it is stated.

Can be used with any of the common brazing methods for brazing on copper or copper alloys, and is said to be ideally suited for applications where brazing temperatures are critical. On heavy sections that absorb large quantities of heat, its low brazing temperature (1225°–1275°F.) substantially reduces brazing time. On fine work or low melting brass, where there is danger of over-heating, it provides an extra margin of safety. No flux is needed in copper-to-copper brazing.

Typical Phos-Silver® uses are found in the assembly of refrigerating and air conditioning equipment, motors and transformers and heat exchangers and plumbing installations.

® Registered.

Gas, Oil Burner, Programming Control

Fireye Programming Control Type 26RJ8 is designed to provide automatic starting and programming control for commercial and industrial gas, oil, and combination gas/oil burner equipment. The product of Combustion Control Corp., 77 Broadway, Cambridge 42, Mass., it is used with the new Firetron Scanner Type 48PT1 to protect burner installations from the hazard of flame failure. The control automatically starts a burner in operation and programs a sequence of pre-purge, ignition-on, fuel valve delay, post-ignition timing, and post-purge.

The control is designed to provide continuous operation under the most exacting ambient conditions to be encountered on industrial installations. It features fail-safe circuits through which component failure within the equipment causes instantaneous shutdown and prevents start-up under any unsafe condition within the entire burner system. Terminal connections are available for directly handling flame failure alarm and modulating motor. Plug-in construction of the chassis provides for simplified replacement and maximum accessibility for examination or adjustment.

Copper Brazing Alloy in Paste Form

Phos-Copper*, a free-flowing brazing alloy with a low melting point for brazing operations on copper and copper alloys, is available in paste form from Westinghouse Electric Corporation. Box 2278, Pittsburgh 30, Pa.

An alloy of copper and phosphorus, its fluidity and wetting properties are said to provide good capillary action that enables it to penetrate tight-fitting joints instantly to form a strong, ductile bond. On most copper applications, no flux is required.

The new brazing paste is finely powdered Phos-Copper suspended in a petroleum jelly. A small amount of this paste placed between the pieces being joined takes the place of a brazing rod, and the joint need only be heated until the brazing filler metal flows. It is designed for resistance brazing where it can be conveniently pre-placed and is packaged in collapsible one-pound tubes and in 5- and 30-lb cans.

This brazing alloy also is available in rod and wire sizes from 1/16- to ¼-inch diameter and in rings and strips (for making special shapes).

*Registered trademark

Roll Grinding Wheel

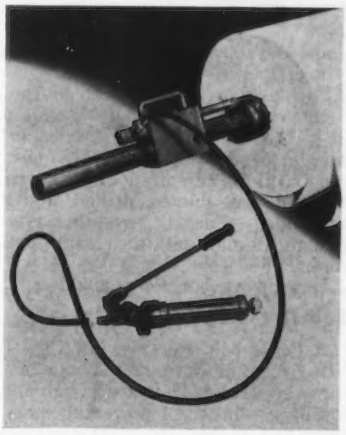
A new type roll grinding wheel has been developed for the paper industry. Known as the E-4 Shellac Wheel, and produced by Norton Co., 1 New Bond St., Worcester 6, Mass., the wheel grinds all paper mill rolls whether made of cast iron, steel, granite, stonite, rubber, or brass, it is stated.

It is available in a variety of specifications to meet exacting requirements, and features: (1) longer wheel life, holding its cut across the roll; (2) faster rate of cut; (3) improved finish with freedom from scratches, chatter, and feed lines; (4) reduced grinding costs; (5) operator acceptance; (6) consistent performance.

Heavy Duty Tachometer Head

Rugged, heavy duty tachometer heads, for measuring a wide range of speeds, are now available from Metron Instrument Co., 432 Lincoln St., Denver 9, Colo. Speeds between 200 and 10,000 r.p.m. for full scale indication are measured by these heads, and they can be overspeeded 2 to 10 times with no damage resulting, the manufacturer states.

Stable performance is assured over a wide range of temperature, humidity, vibration, or magnetic fields. Permanent lubrication for an extreme temperature range is employed throughout. All heads of the same type number are completely interchangeable and require no special matchings or adjustments.



Hydraulic Core Jack

Introduced by John Dusenbery Co. Inc., 271 Grove Ave., Verona, N. J. is a Hydraulic Core Jack for pressing chucks into mill rolls.

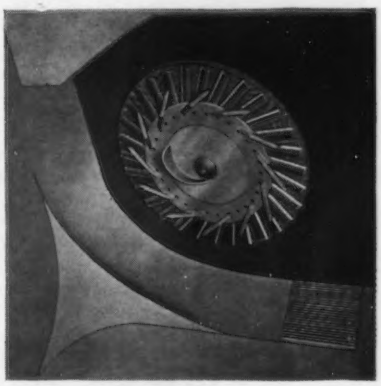
Designed as a modern answer to an old problem of driving cone type chucks into mill roll cores on unwind shafts, the standard jack is available to fit shafts up to 2⅜" diameter. Sleeves to adapt one jack assembly for several shaft diameter also can be had.

According to the manufacturer, the two-ton force of the ram can drive a cone into the core of a mill roll far more effectively than the impact of a heavy sledge hammer or most types of screw jack arrangements, with less operator fatigue and no danger of injury to equipment. Field tests show complete elimination of loosening and damage to the mill roll core while unwinding, it is stated.

Arc Welded Thin Diaphragms

The Bristol Co., Waterbury 20, Conn., announces its new factory facilities for making arc-welded diaphragms of extremely thin stainless steel, Ni-Span C, and phosporous bronze.

Diaphragms in thicknesses of from 0.0015 to 0.005 of an inch for pressure transducers, pressure elements, and seals for many applications, are being arc welded. Specially developed equipment makes it possible to successfully arc weld these extremely thin diaphragms, it is stated.



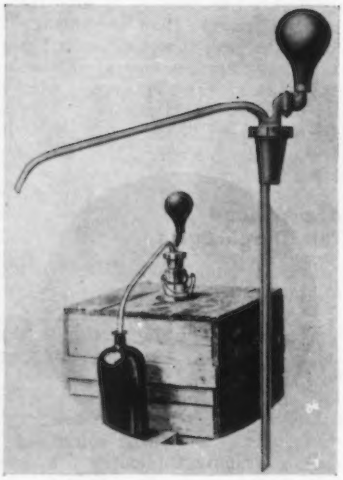
Beatapulper

A unit that pulps, defibers and refines paper stock all in one operation is being introduced by Cowles Company, Inc., Cayuga, N. Y.

Known as Beatapulper, it features the complete treatment of mixed furnishes. The dispersing action of the impeller, plus beating action of the knives, permit chemical treatment, size, alum and color to be added at any time during the batch cycle.

Fibers are selectively picked up by an advancing knife edge and brought into mechanical contact with a stationary bedplate or refining disc. Bedplate is constructed of heavy steel and has radial grooves 3/16" wide by ¼" deep. Due to the flow from the impeller ring these grooves are kept full of moving stock. Anything small enough to get into the grooves, like wire or nails, is sheared off by the knife. Trash too large to enter the grooves is pushed away by the impeller and knives.

The unit is designed so that pressure between the knives and bedplate can be varied and controlled by means of a regulating valve in the cylinder supply line. The entire assembly is mounted on a heavy back plate and bolted to pulper tub.



Manually-Operated Pump for Acids

Supplied in hand- or foot-operated models, the Pneumatic Acid Pumps were designed to provide a safe and sane method of acid handling. The product of General Scientific Equipment Co., 27th and Huntingdon St., Philadelphia 32, Pa., they are said to be finding wide usage wherever liquid must be removed from carboy, drum or barrel.

According to the manufacturer, corrosive and other liquids flow smoothly and stop instantly, they come in contact only with the corrosion-resistant tube and cannot affect other parts. When the pump is removed, acid drains completely. No tilting of the container is necessary and danger of a slip, a splash or a spill is minimized.

Either model can be equipped with a lead tube for sulphuric, hydrochloric, hydrofluoric and similar acids or with a Saran (flexible plastic) tube for nitric, phosphoric, acetic acids, peroxide and many other liquids.

Automatic Protecto Spray

Automatic Protecto Spray is described as a new weapon against fire in hazardous storage and volatile materials. According to the manufacturer, Grinnell Company, Inc., Providence, R. I., it dilutes the active ingredients of flame, and when used in place of standard automatic sprinklers reduces ceiling scorching and checks fire spread with 30 percent less water.

The result of years of research into the nature of flame, the new product is aimed at fighting fire at the molecular level by diluting both the oxygen and the hydrocarbons with water vapor until the mixture is too lean to burn.

The heat from a fire normally raises the temperature of nearby flammables to distillation and ignition temperatures. The new product diverts this heat to vaporize water droplets. The resulting water vapor dilutes the flame gases, producing a wide range of water droplet sizes, small ones to produce water vapor and larger ones to wet and cool the burning material. Held to be a more effective weapon against fire, it is approved by Factory Mutual Laboratories and the Underwriters Laboratories.

Building and Insulating Material

Kaylo® is the trade name of a building and insulating material pioneered by Owens Illinois Glass Co., Kaylo Div., Toledo 1, Ohio.

A chemical compound of lime and sand (and small amounts of asbestos fibers), it was introduced to a limited market in 1943 and now has become generally available. Described as lighter than wood, a better thermal insulator than gypsum, stronger than the common materials used for insulation, and as incombustible as concrete, the calcium silicate product is marketed under the brand name of Kaylo, also is used by other manufacturers as a core material for prefabricated wall sections, firedoors, ventilating units, and for absorption units in humidifiers, etc. An unusual product made of the material is a tapper for blast furnaces.

Fields where it is said to be rapidly replacing other materials are in pipe insulation and insulating blocks, in insulating roof tile, laminated panels for construction, and firedoors. It can be sawn, nailed, shaved, drilled, and may be bonded to nearly any other type of structural material, the manufacturer states.

Descriptive booklet available.

Belt Dressing Sprays On

A liquid belt dressing, GRAKO (R) CLEAR, is now marketed in a 12 oz. spray container. Depressing valve with forefinger directs a powerful spray at belts and pulley faces. Manufactured by Graton & Knight Co., 356 Franklin St., Worcester 4, Mass., the package contains enough liquid to treat approximately 350 square feet of belting.

Spray is directed at smaller pulley face where slippage is most likely to occur. A fine mist of dressing is transferred evenly to belt where it is quickly absorbed by the leather fibres. Since the spray can be directed at any point, upward or downward, the operator is able to treat moving belts without exposing his hands and arms to danger.

Sold by industrial distributors. Literature available.

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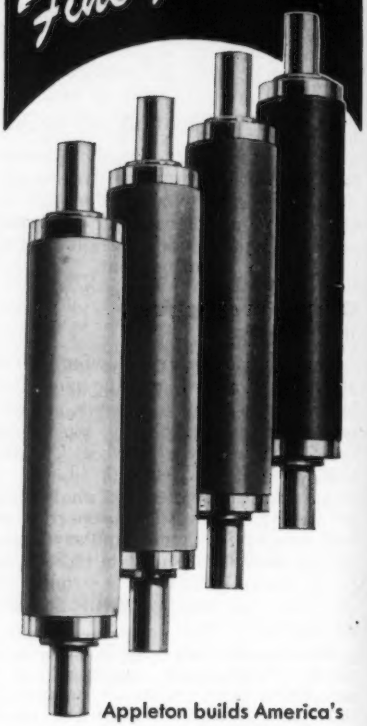

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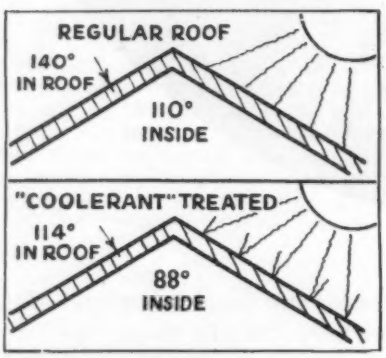
Totally-Enclosed Double Suction Pump Unit

Design improvements in its line of small, single-stage double-suction pumps are announced by Ingersoll-Rand Co., Dept. CAM, 11 Broadway, New York 4, N.Y. Known as Class DMV-DHV, they embody double mechanical shaft seals with sealed, prelubricated ball bearings. The result is a compact, totally-enclosed pumping unit that requires minimum attention and maintenance and reduces floor space requirements.

Built in 3, 4, 5 and 6-inch sizes, the DMV (for medium heads) and the DHV (for high heads) are designed for general hydraulic services at temperatures up to 200°F., capacities to 2100 g.p.m. and pressures to 150 p.s.i.

Standard materials — cast iron casing, carbon steel shaft and bronze impeller — are used to equip the Class DMV-DHV pumps for any non-corrosive service. Information is available from the manufacturer on request.



Roof Coolerant

Manufactured by Tropical Paint and Oil Co., 1210-52 W. 70th St., Cleveland 2, Ohio, Roof Coolerant is brushed or sprayed by unskilled labor to reduce below-roof temperatures to the comfort zone by deflecting up to 75% of the sun's radiant heat.

Consists of large flakes of metallic aluminum applied with a special liquid bond, creating a complete, seamless, silver blanket that stays bright and which throws back the sun's heat. According to Tropical, tests show that when it is 96° in the sun, temperature within the roof structure will build up to 140° with a below-roof working zone temperature of 116° and that the same day Coolerant is applied, users have found as much as 26° improvement in both roof and below-roof temperatures.

Also claimed for the product is that: (1) it prevents rapid drying out of the roof; (2) prevents cracking and leaking that results from a brittle, inflexible roof; (3) helps retain flexibility needed for expansion and contraction of sudden temperature changes; (4) prolongs roof life.

Diagram illustrates the action of Roof Coolerant in reducing heat inside buildings.

Electronic Timer

General Control Co., 1200 Soldiers Field Rd., Boston 34, Mass., has developed a Promatic Electronic Timer said to be capable of controlling timed operations between 60 milliseconds and 60 seconds.

The discharge of a resistor-capacitor network through a sensitive gas tetrode relay tube provides the basis for each timing period, duration of which may be manually set by a potentiometer. Steps within the overall timing range are adequately covered by plug-in condensers, it is stated.

Time period is set manually by means of the indicator and the large 3⅜" dial. Timing commences upon closure of any external switch; control contacts either open or close at end of timing, depending upon actual circuit requirements. Control contacts are double-pole double throw, rated at 10 amperes, 125 volts a.c., non-inductive. Operation is from 115 volts a.c. or 220 volts a.c., 60 cycle.

Typical applications include: automatic process control, on machine tools and molding machines, for laboratory life tests, etc.

Meters and Controls Flow and Liquid Level

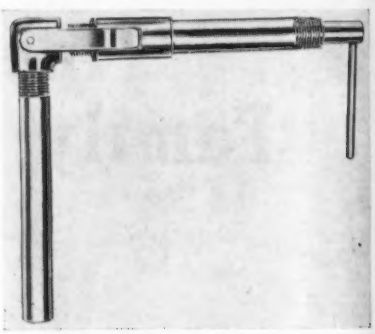
A new receiver for measurement and control of flow and liquid level has been developed by Brown Instruments Div., Minneapolis-Honeywell Regulator Co., Wayne & Windrim Aves., Philadelphia 44, Pa.

The new unit, an Electronik inductance bridge receiver, the instrument makes it possible to indicate, record, integrate and control flow and liquid level; an important factor in many applications where conservation of panel space is a vital consideration. Data also can be retransmitted pneumatically to a second receiver remotely located. An Indexet mechanism is available to rest the control index from a remotely located transmitter.

Held to be accurate to within ± ½ of 1% of full scale, the instrument can be easily installed in replacement of older inductance bridge receivers, does not require any special provisions or extra equipment, can be used with any of Brown Instruments' electric flow or motion transmitters.

Raincoat for Masonry

Called an invisible raincoat for masonry walls, and known as Hydrocide S.X. Colorless, the new Silicone is designed to make all types of above-grade porous masonry water repellent immediately after drying. According to the manufacturer, L. Sonneborn Sons, Inc., Dept. P-2, Building Products Div., 80 Eighth Ave., New York 11, N.Y., one application repels a driving rain. S.X. penetrates, thus making the masonry itself water repellent. Claimed for the product also is that it is invisible, will not discolor or wear away; insures clean appearance of buildings, sheds dirt, controls efflorescense, and is long-lasting. Literature available.



Install Type Syphon

Described as the little tool that does a big job, the Install-Type Syphon is designed to eliminate the possibility of losing the vertical section when inserting in dryer. Produced by H. G. Cram & Associates as a part of the Dryer Drainage System for the papermaker, it eliminates the difficulty and expense of bending the syphon pipe.

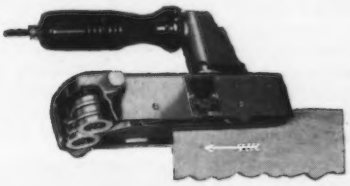
Features also (1) better removal of condensate, as inlet can be placed nearer to shell of dryer; (2) reduces the danger of syphon contacting the shell of dryer because of oscillation or vibration; (3) reduces strain on syphon pipe at steam joint by reducing the weight and leverage; (4) size of supporting pipe may be greater than that of the vertical leg, thereby reducing the total weight of the syphon; (5) installation or removal is accomplished in 10 percent of usual required time.

Magnetic Fixture for Thickness Testing

Announced by Branson Instruments, Inc., 430 Fairfield Ave., Stamford, Conn., is a magnetic fixture for use with the ultrasonic Audigage Thickness Tester. The accessory is designed to assure the essential good contact; to prevent accidental shifting of the Searching Unit during tests; and permit one man to operate the instrument alone in different locations. It is particularly valuable when working on ladders or staging, and when test points are beyond easy reach, such as in sulphate and sulphite digesters, it is stated.

The fixture consists of a flat spring with an Alnico permanent magnet coupled flexibly to each end, and means for attaching the Searching Unit quickly and easily to its center. The standard magnets are of sufficient strength to hold the Unit properly against surfaces that are slightly irregular or covered with a thin coat of paint. Heavier magnets can be provided for use on cast-iron and other rough surfaces, or on plates that are covered with thick coatings of paint or scale. The standard fixture is only 5 inches wide and weighs 6 ounces.

Audigage Ultrasonic thickness measurements are held to be of particular value where only one side of the pipe, tank, or other vessel is accessible, because they eliminate the slow and costly "drill-and-plug" technique formerly used to keep tabs on the progress of internal corrosion. The Audigage is also useful in detecting laminar and other flaws invisible to the eye, the manufacturer states.



Hand Rotary Sealer

A new development of a Hand Rotary Sealer primarily for military packaging that requires large bags, pouches, barriers and innerliners of kraft-backed and scrim-backed laminates is announced by Pack-Rite Machines of Milwaukee, Wis.

Known as Model G, the sealer makes tight seals at splices and over-laps of large enclosures fabricated from spliced material. Thus, it is possible to obtain a vapor and moisture-proof seal at points where material is of extra thickness by making a seal with two grooved impressions. This form of seal is made by having double grooves on one of the pressure sealing rolls meshing with double beads on the other roll.

When splices are encountered and the seal made over extra thickness of material, provision has been made to "soak" in more heat in order to fuse and soften the thermoplastic. This is done by spring loading one of the preheater bars, which brings both bars at slight pressure in direct contact with the material.

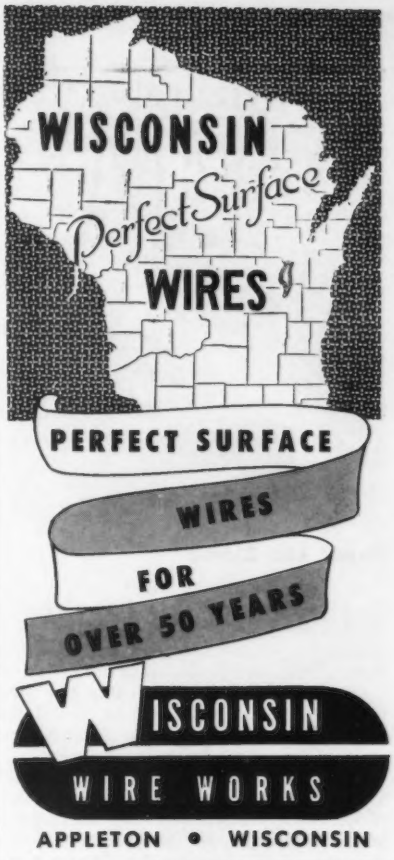
This sealer makes seals with a "once-over" forward operation and can be operated at a speed of about 30 feet per minute. It weighs only 5 pounds and is easily handled by women. The over-all dimensions are — length 10½", width 4", height 6".

Automatic Gas Torch

An automatic acetylene-air gas torch is announced by the Velocity Power Tool Company, 7505 Thomas Blvd., Pittsburgh 8, Pa.

Pistol-shaped, Torch-O-Matic lights at squeeze of trigger and shuts off upon release, eliminating separate operation and equipment for relighting, manual valve adjustment, pumping or priming, and warm-up. Squeezing the spring-loaded trigger simultaneously opens the torch gas valve and sparks the heavy-duty flint for ignition. Trigger also can be locked open for continuous flame. One-hand operation makes for better user comfort and efficiency.

Unit weighs 12 ounces, provides instantaneous heat up to 2800 degrees. Combustion tubes available in ⅛ inch, 3/16 inch, and ¼ inch sizes — permit use of the torch for any air-acetylene job, from heavy soldering or heating to the finest precision work.



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Write for Bulletin "P." Hydro Silica Corporation, Gasport, N. Y.

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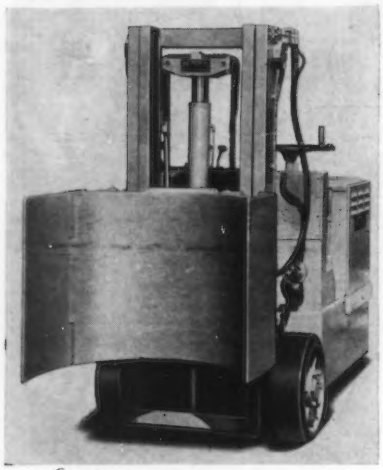


Paper Roll Clamp

A hydraulically-actuated roll handling assembly for their line of fork trucks has been announced by the Mercury Manufacturing Co., 4044 South Halsted St., Chicago 9, Ill.

Clamp assembly is constructed in unit fashion so that it can be installed in place of standard forks. Pressure connections are quickly detachable, self-sealing; and electrical connections are plug and socket type. Two bolts retain the assembly on lifting carriage, and installation or removal and replacement has been timed to 20 minutes or less.

A "flipper" arrangement involved in the clamp itself provides unique operating characteristics, it is stated. Horizontally disposed rolls can be easily picked up without necessity of blocking and without employing the special forward tilt range usually employed. According to the manufacturer, it is also possible to break rolls from tightly packed shipments by the simple procedure of sliding them sideways by use of the flipper movement.

Continuous and positive clamping action is said to be constantly maintained through the use of a specially designed hydraulic system which includes a locking valve in the clamping cylinder and a pressure switch in the pump motor circuit.

Clamp illustrated handles 3,700 lb rolls varying in diameter from 30 to 36 inches. Clamps for other roll diameters and rolls weighing up to a maximum of 5,000 lb. are available.

Mercury Switch

Newly designed mercury switches, embedded in plastic "potting" compounds for added protection against mechanical shock, impact or other mechanical hazards are announced by Micro Switch Division, Minneapolis-Honeywell Regulator Co., Freeport, Ill.

In addition to being more rugged, the embedded designs also offer additional new means of mounting mercury switches. First of the new assembles is the IMPI switch, overall size 2½ inches long, ¾ inch wide, and 1⅛ inch high. This unit provides less than 1 degree differential angle, with an electrical rating of 2 amperes 115 volts a-c; or 1 ampere 115 volts d-c. Contact arrangement of this switch is single-pole, normally open. Mounting holes have been provided to accommodate ¼ inch mounting screws and pins.

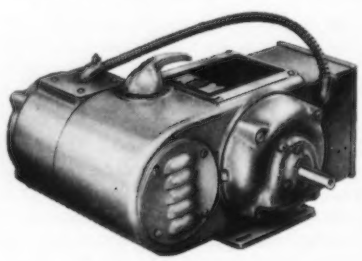
Universal and Single-Range Hand Tachometers

Two new tachometers have been placed on the market by O. Zernickow Co., 15 Park Row, New York 7, N. Y.

To be known as O-Z Universal and O-Z Single Range Tachometers, they have in common the knife-edge hand which is designed to make almost two complete turns for each range. Each features a patented cross pendulum which operates on the centrifugal governor principle.

Featured also are high speed, light wind vane damping mechanism designed to eliminate all vibration of the indicating hand, yet lets the hand indicate speeds and speed variations instantly without the slightest lag.

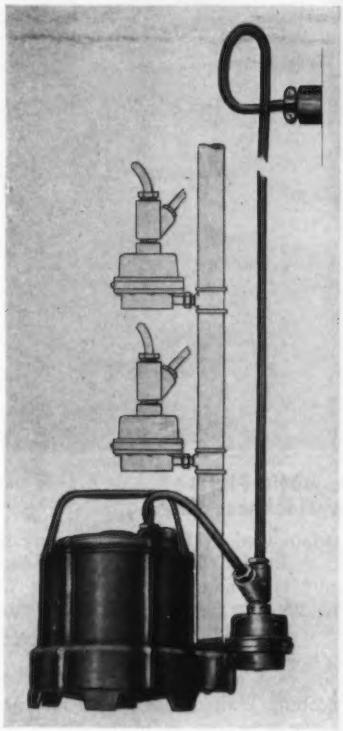
Write to manufacturer for descriptive literature.



Variable Speed Motor Single Phase

A new development in single phase variable speed motors in fractional horsepower is announced by U. S. Electrical Motors, Inc., Box 2058, Los Angeles 54, Calif.

A modification of the company's Type VA Varidrive line, the new motor permits use of 110 or 220 volts. Designated as Type VA-C Varidrive and made in ¼, ⅓, ½, and ¾ hp., the lightweight motor provides speeds in a 10:1 ratio with the range from 4 to 10,000 r.p.m. By turning a handy control dial, its speed can be changed instantly to a desired speed without stopping. Occupying little more than a standard fixed speed motor, it eliminates the necessity of an external speed changing device or gear box. Write for Bulletin No. 1601.



Precision Automatic Control of Water Level

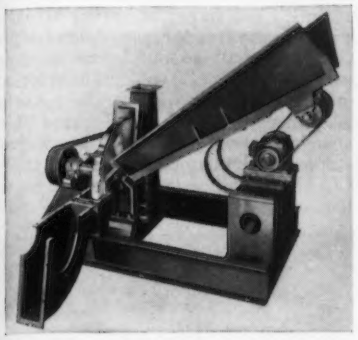
Precision, automatic control of the water level at which sump and circulating pumps will turn on is offered by Kenco, Inc., 1125 North Ridge Rd., Lorain, Ohio.

With the KENCO switch and submersible KENCO pump, pump can be set to exactly suit the conditions under which it will operate. For example, if a sump is small with a constant flow of water entering, the switch can be placed just as high as necessary on the discharge pipe to keep the number of cycles to a minimum. Otherwise, pump operates too frequently. This same method can be used for sump or circulating pumps where it is desirable to pump a tank or sump dry after letting it fill to a desired height.

If it is desirable that a certain amount of liquid remain in the tank or sump, the pump can be placed on blocks to raise it to the required height and brings precision automatic control to pump users. Perfect operation on special jobs like these is said to be assured by the submersible KENCO Switch which has no exposed electrodes or floats to corrode or stick.

Further, the submersible KENCO

circulating or sump pumps operate at any practical depth, are completely submersible and waterproof and lend themselves to either permanent or temporary installations. Capacities up to 3300 GPH at 10 foot head.

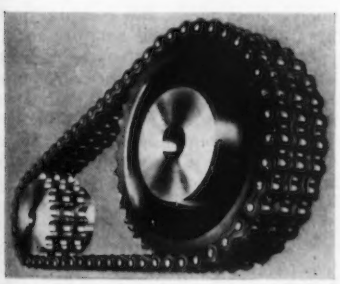


Rechipper

A rechipper that is said to produce chips of quality comparable to that of a large chipper yet requires less horsepower than other types of chip reject processing equipment of the same capacity is produced by D. J. Murray Manufacturing Co., Wausau, Wis.

Called Murco Rechipper, it holds sawdust to a minimum, and when a blower is used there is no need for a chip conveyor on the machine, says the manufacturer. Design of vibrating spout causes slivers to lie lengthwise; slivers are cut crosswise.

Capacity of unit is 300 to 400 c.f.h. with ½" chips and vibrating feeder; 600 to 700 c.f.h. with stationary inlet. Drive is either V-belted or is direct-connected to 15 hp. motor. Disc, of hot roll steel, will accommodate six knives mounted in seats recessed into disc. Requires relatively small floor space.

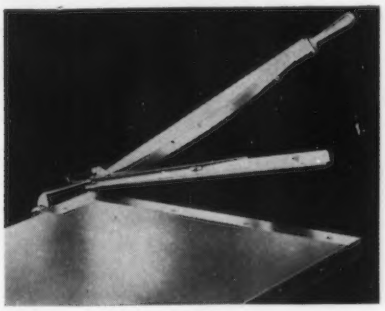


Bushing Chain

Whitney Chain Co., 237 Hamilton St., Hartford 2, Conn., announces a special roller chain incorporating oil-impregnated sintered metal bushings.

Requiring little or no lubrication, the chain was designed to meet the need for a chain drive which would operate efficiently where conventional lubrication methods are either not possible or not desirable. Laboratory tests and field installations of the Sintered Bushing Chain indicate a marked increase in service life on applications where normal lubrication is not available, according to the manufacturer. Pictured is a typical roller-chain drive of which the new bushing is a component part.

Industrial application will be subject to engineering approval of the manufacturer. Production will be limited and restricted to several sizes, for the time being.

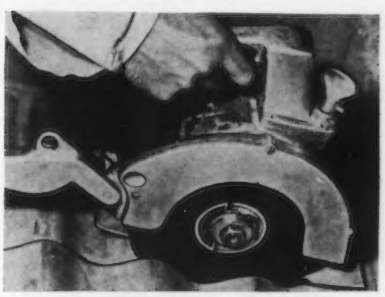


Bench Paper Cutter

The bench model paper cutter, to be known as Jacques, Jr. (Alfa) Cutter, is designed for accurate, easy cutting of paper, plastics, and other light materials. Manufactured exclusively by Hobbs Manufacturing Co. (Dept. N-14), 26 Salisbury St., Worcester 5, Mass., and said to be specially useful in cutting continuous material from rolls or strips, the new cutter is lighter, less expensive and more versatile than the Jacques, heavy-duty industrial shears.

Outstanding features include: (1) exclusive, automatic clamp which securely holds material to be cut; (2) clamp has surface of sponge rubber and automatically presses against material as blade is brought down in cutting position; (3) spring tension device presses entire blade area against guide to assure clean, accurate cuts without adjustments; (4) safety spring attached to blade handle holds blade in open position to prevent accidental dropping and cutting; (5) sturdy all-metal construction assures exceptionally long and accurate cutting life.

Available in three sizes to cut up to 24", 30", or 36" widths.



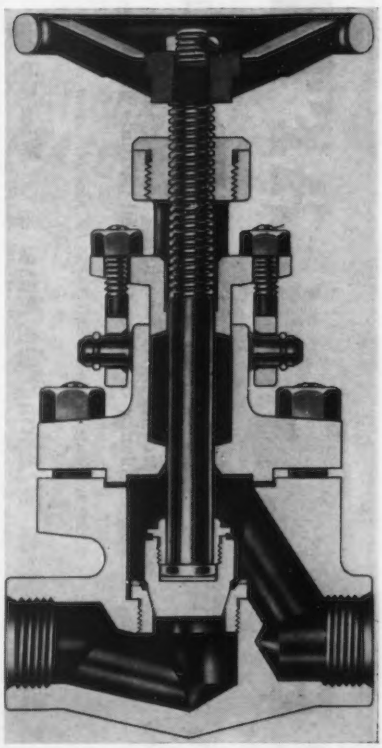
Reinforced Abrasive Blades

Difficult edge cuts, grooving cuts, and grinding type cuts can now be made with complete safety with Tuffie reinforced masonry blades, says the manufacturer, Eveready Briksaw Co., 1509 S. Michigan Blvd., Dept. 271, Chicago 5, Ill.

Reinforced internally with layers of strong fabric, and further protected by a safety web molded into the blade surface, the new blade is held to be virtually indestructible. Because of its ability to withstand twisting strains and binds, the blade is particularly outstanding for use on any make hand-power saw.

Specially suited to the cutting of concrete block, cinder block, most common brick, and the softer ranges of stone, Tuffie is not recommended for cutting the very hard, vitreous materials such as Glazed Tile, Acid Proof Brick, Terra Cotta, etc., because of its extreme toughness. These materials are best cut with the wet or dry abrasive blades or diamond blades, Eveready says.

Blade sizes range from 12" to 18" in diameter for masonry saws and 6" to 8" diameter for hand power saws.



Valves for Chlorine Gas and Liquid Service

OIC 600-pound forged steel globe and angle valves for chlorine gas and liquid service are announced by Ohio Injector Co., Wadsworth, Ohio.

Built to give long lasting, trouble-free service, the valves have heavy, uniform wall-thicknesses throughout, and rugged male and female flanged body-bonnet joints secured with alloy steel bolting. Joints are sealed with soft Monel gaskets. Seat rings and discs are of Hastelloy "C." Stems are Monel. Stuffing boxes are filled with a packing which is held to be highly

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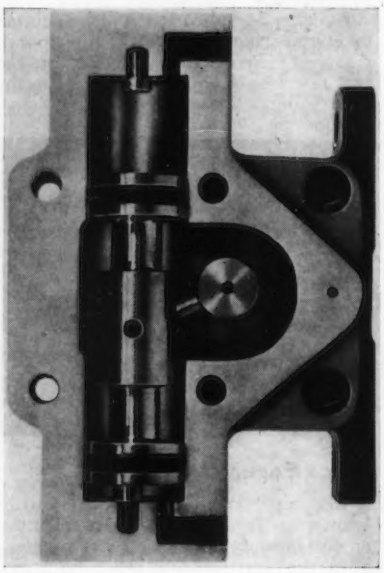
resistant to the corrosive actions of chlorine. Both globe and angle are available in sizes ½" through 2".

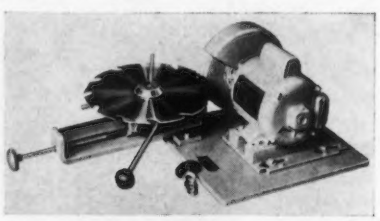


Power Operated Valve

Announced by Ledeen Manufacturing Co., 1500 So. San Pedro St., Los Angeles 15, Calif., is POV Power Operated Valve available in six sizes suitable for air, oil and water operation with option of finger, cam, toe or solenoid pilot controls.

Designed to serve a variety of purposes where hand- or foot-operated valves cannot be used, the new valve is essentially a standard four-way valve. Rotation of disc, however, is accomplished by means of a piston moved by the operating fluid pressure of the main line and controlled by small pilot valves suitably located and actuated. Applying pressure through pilot on one end of the piston forces it to move ahead and rotate valve disc to forward position. Applying pressure on opposite end moves the piston back and rotates the disc to reverse position.

Details, including operating and circuit diagrams and applicable pilot valves, in Bulletin 1000 which will be sent on request.

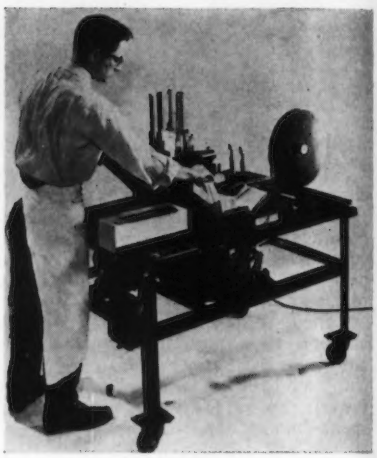


Circular Saw Sharpener

Known as Easy Cut, and said to be the first American made machine of its kind, the new cam-actuated circular saw sharpener is being introduced by the Hanchett Manufacturing Co., Big Rapids, Mich., and Portland, Ore.

Designed for wide-tooth spaced saws (safety type), the balanced sharpener accurately generates the correct tooth shape with uniform, sharp, clean saw teeth, it is stated.

Capacity for saws is from 6" to 24" in diameter, special capacitor motor is ½ hp. Feed finger is spring-actuated, and adjustment for saw hook is provided from 0° to 30°. Saw bushings in sizes from ¼" to 2" diameter are included together with the Red Anchor grinding wheel and wheel guard. Unit also performs efficiently as a hand gummer. Announcement Bulletin No. EC-34 available.



Automatic Envelope Counter

A machine that takes up to 30,000 loose envelopes or cards in an hour and stacks, squares, counts and bands them in groups of 12 or 25 is being marketed. Originally developed by Berlin & Jones, Inc., 601 West 26th St., New York 1, N. Y. to serve the firm's own high-volume envelope counting and banding needs, the machine is being studied by other sections of the paper industry for other applications.

The device is an electrically-powered, cam and rocker arm operated unit, 50 inches long, 34 inches wide, and with a table height of 30 inches. Overall height is 52 inches, weight 425 pounds. Requires 110 volts, single phase A.C. for operation. A vacuum pump moving 97 cubic inches of air per revolution is required for envelope feed, or the machine may be attached to a plant vacuum system of that rating. Equipment will operate with a 1 h.p. 1150 r.p.m. 110 volt A.C. motor turning a pump which will draw 6 inches of mercury. Recommended by the producer is an 8-inch pump which requires 1½ h.p. 200 volt, three phase A.C. motor, also a vortex oil filter for the vacuum side of the pump.

Write for descriptive booklet.

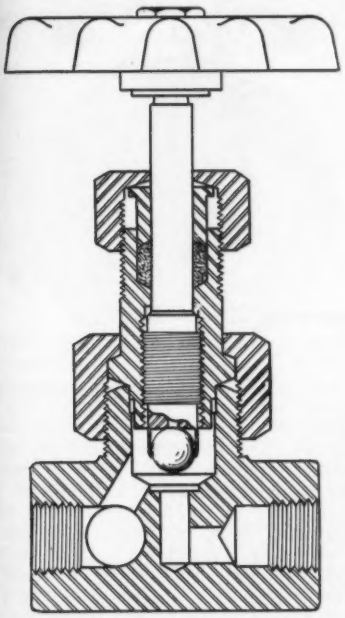
Acid and Alkali Resistant Coating

Known as Barreled Sunlight Acid and Alkali Resistant Coating, the product of Barreled Sunlight Paint Co., 24

Dudley St., Providence 1, R. I., the chemically-resistant finish is intended for use where conventional type finishes have proven unsatisfactory.

Applied by brush or spray, it dries, says the manufacturer, in two to three hours to a hard, tough, medium gloss finish of excellent flexability. Since it dries entirely by evaporation of its solvents, it may be recoated immediately after the 2-3 hour drying period. It has good hiding properties and on smooth surfaces will cover up to 300-400 square feet per gallon, it is said. Highly impervious to moisture and seepage, and resistant to fumes and solutions of corrosives, it also is recommended by the maker for helping to control mildew growth; it can be washed repeatedly with antiseptic solutions; is impervious to alkali, and is ideal for painting newly-poured concrete floors and walls at or below ground level.

Descriptive literature available.



Ball Valve Provides Tight Seating at 3000 Psi

A ¼" ball valve of unique construction, designed for working pressures up to 3000 p.s.i., is announced by Foxboro Co., Foxboro, Mass.

Held to be especially useful on meter manifolds, gauge lines, seal chambers, bleed-off connections, sampling connections and lubricator shutoffs, the valve is universally adaptable in applications for liquid, gas and steam service.

Tight, positive shutoff is provided by a stainless steel ball which closes into a machined, conical seat. The ball, retained at the end of the stem, is free-rolling so that every closing brings a new surface into contact with the valve seat. Alignment of ball to seat is accurately piloted by a forged steel, union-type bonnet, fitting tightly to the body and assuring a correct valve closure.

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Long-stroke stem and packing gland are made of stainless steel for durability and resistance to corrosion. Packing is a preformed, graphited asbestos with a plastic binder, and can easily be replaced without shutting off the line pressure or interrupting the process. Straight-through and angle types are available with two and four connections, meeting the wide range of valve-design requirements found in general industrial use, as well as in pilot plants and laboratories.

Power Dispenser for Steel Strap

The mill type power strap dispenser is manufactured by the Signode Steel Strapping Co., 2600 N. Webster Ave., Chicago 47, Ill.

Built to handle ribbon-wound strap in ¾", 1¼" and 2" widths, the machine feeds strapping at the rate of 6 to 10 feet per second. Cutting requires only 2 to 4 seconds. Compactly made, it occupies a space of only 3' x 5', stands only 3' high, and weighs 874 lbs.

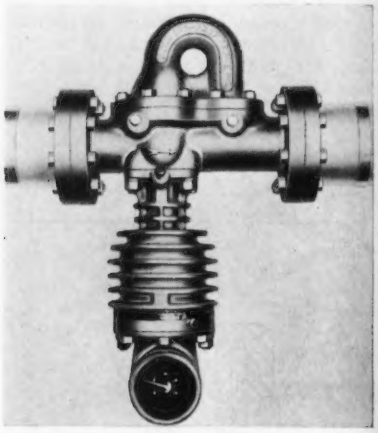
Operation of the dispenser is described simple and foolproof. The operator places a coil of strapping in the coil holder, feeds the end of the strap into position manually, and closes the safety door. (The machine cannot start until the safety door is closed.) A push button controls the length of strap to be fed through the cutter jaws. When the proper length is reached, the button is released. Cutter handle is pulled toward the operator and the job is done.

Practical for any application which uses heavy-duty steel strapping in volume.

Industrial Safety Mirrors

A newly developed line of Klear-Vu Safety Mirrors for industrial use is announced by Lester L. Brossard Company, 540 No. Michigan Ave., Chicago 11, Ill.

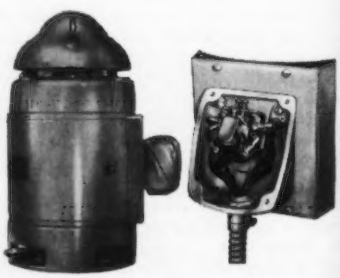
Designed for use in plants where blind corners, cross aisle intersections, entrances and exits present a serious safety problem because of traffic accidents, they clearly reflect the movement of oncoming floor traffic from opposite directions — thereby removing the principal cause of collisions. Units are easily installed and are adjustable for setting at any desired angle. Diameter dimensions of two circular *convex* glass mirrors offered are:— 12" and 18". Two sizes are offered in flat rectangular glass mirrors:—9"x18" and 16"x24". The mirrors are also adaptable for use on various types of production machinery and equipment.



Improved Steam Meter

Builders-Providence, Inc., 345 Harris Avenue, Providence, R. I., announces a redesign of Model SMKS Shuntflo Meter for steam, air or gas. Used widely for departmental heating and process work, the meter boasts the following improvements: 1. New, streamline damping chamber to facilitate a more uniform cooling system; 2. All Meehanite body casting for greater strength and durability; 3. A more simplified rotor mechanism to assure greater efficiency of operation, easier replacement of parts and longer service; 4. Strengthened rotor shaft designed to withstand slugs of undue condensate in the line or sudden fluctuations in line pressure.

Shown is front view of unit with single, combination cooling and damping chamber.



Single Phase Vertical Hollowshaft Motors

Recently added to the line of U. S. vertical motors is a series of single-phase hollowshaft motors, types SCU-C and SCU-R. Available from 1½ to 5 h.p. with speeds of 1800 or 3600 r.p.m., from U. S. Electrical Motors Inc., 200 E. Slauson Avenue, Los Angeles 54, Calif., the SCU-C and SCU-R motors feature asbestos protection of windings, Lubriflush lubrication, normalized castings, solid centricast rotor, downdraft ventilation, adjustable hollowshaft, reverse protection clutch, conservatively rated capacitors and weatherproof housing.

Introduced into the line of motors, is a simpler method of disconnecting the starting capacitors, viz., the accelerating type relay. Similar to those used in hermetically-sealed refrigerator units, the relay was designed into the split-type outlet box located on the side of the motor, and provides maximum performance with positive relay operation over the widest variation in line voltage, it is stated.

Descriptive bulletin available.

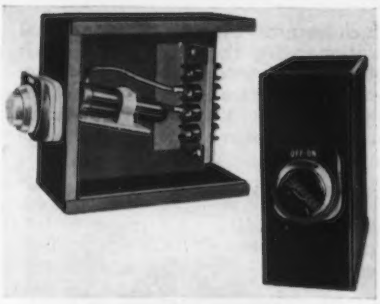
Six-inch Dial Indicator

A newly-designed Dial Indicator for modern instrument panels, also for individual mounting, is released by Taylor Instrument Companies, 95 Ames St., Rochester 1, N. Y.

Primarily developed to meet the requirements of temperature, pressure and load applications in industrial processing, the unit has a high-visibility dial with white graduations and numerals on a black background. Its white wedge shaped pointer or indicator is provided with a micro-adjustment to permit easy and accurate zero setting. A notable feature is the new stainless steel movement designed to eliminate linkage errors.

The design of the instrument provides for almost universal actuation by any variable that makes use of a Bourdon spring as an energy to-motion converter. For temperature applications, four different types of actuation are available: Mercury, Vapor, Gas or Organic Liquid (Monolex). Ranges from minus 100 to plus 1200°F. For pressure applications, range spans from 12 to 20,000 p.s.i. are available. Tension and compression load elements can also be built in for load applications with ranges from 0 to 75,000 pounds.

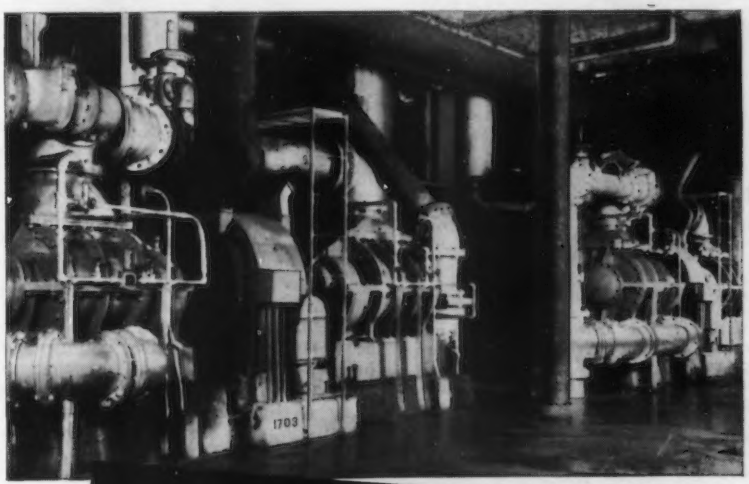
Bulletin 98214 available from Advertising Dept.



Mercury Safety Switch

A new mercury switch for positive safety in hazardous, explosive locations has been developed by the Tigerman Engineering Co., 4332 North Western Ave., Chicago 26, Ill. Operating heart of the unit is a hermetically sealed mercury switch, mounted on a lever-operated armature. The switch is set in operation by a selector knob or push-button which inclines the armature and actuates the mercury switch. Any possibility of a spark is eliminated because of the all-mechanical nature of the actuating linkage, it is stated.

Designed for vertical panel mounting, the new mercury switch is a single-pole, with either single or double-throw action. On all push-button models a spring action is featured



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Paper manufacturers who have installed R-C equipment find they can depend on it, day after day, year after year. The simple, rotary positive design and sturdy construction account for this extremely satisfactory record of performance.

Naturally, these R-C users like the lower first cost of motors, gained by higher operation speeds and greater efficiency of R-C Pumps. In days of high costs, the annual power savings bring a handsome dividend.

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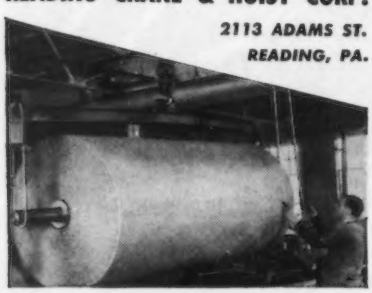
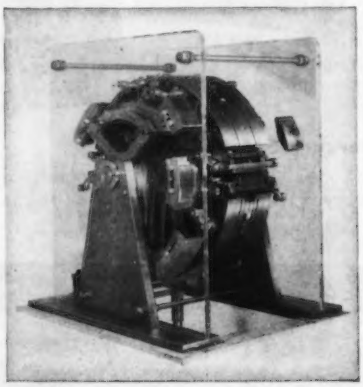


READING CRANES

which returns the switch to original position when the finger pressure is released. The selector switch type can be set at any time in either "on" or "off" position. Cut shows details of both push-button and selector type units.



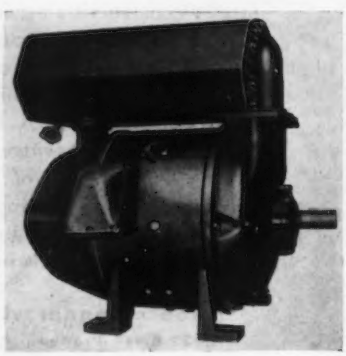
Bottom Folding Drum

Illustrated is a display model of the bottom folding drum and cam arrangement from Weber #5 S.O.S. Special Bag Machine made by H. G. Weber & Company, Inc., for Ampco Metal, Inc., Milwaukee, Wis.

The bottom folding drum is held to be an achievement in bag making and in machine design. Bag size changes are quickly made because the various parts and fingers particularly are adjustable, rather than requiring interchangeable parts.

Due to high production speeds required, as well as endurance and margin of safety, Ampco metal is used in all critical parts—such as drum clamps, drum fingers, opening cylinder fingers, center gripper finger holders, and complete cam system.

Equipped with this bottom folding drum and cam arrangement, the #5 S.O.S. has a capacity up to 300 bags per minute and produces a wide range of one- and two-ply self-opening style and satchel bottom bags for packaging such products as sugar, flour, etc.

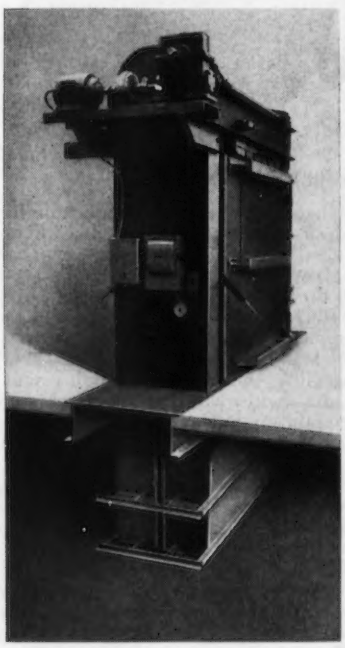


Dual Motor Totally Enclosed

Reliance Electric & Engineering Co., 1088 Ivanhoe Road, Cleveland 10, Ohio has developed what may be termed a totally-enclosed, dual cooled motor equipped with heat exchanger as an integral part of its frame. A ½ h.p. 3 phase, 60-cycle motor built into the heat exchanger runs at 3600 r.p.m. to drive internal and external fans independently of the main motor itself. Heat exchanger sections are cast aluminum with both internal and external fins for maximum heat dissipation. Air velocity through the internal sections of the exchanger is 2900 f.p.m. In the external path between the cover and the exchanger bank the air is pumped at 3300 f.p.m.

In addition to the better overall cooling provided, the new motor design provides a number of other advantages. Because cooling efficiency has been increased, use of smaller motors for a given horsepower is possible. This, in turn, permits construction of totally enclosed motors up to 150 h.p.—double the limit previously imposed.

According to Reliance, the new design also simplifies maintenance, since the use of wide exposed aluminum fins, plus the high velocity at which the air is swept past them, tends to keep them clean. Should they become fouled with foreign matter, removal of the cover makes the exposed fins readily accessible for cleaning.



Pit Baler For Waste Paper

A newly-designed Pit Baler for waste paper and rags has just been announced by E. W. Loeser Company, 1352 Genesee St., Buffalo 11, N. Y.

An automatic up-stroke press with hydraulic-mechanical drive, the new unit was built by Firewel Company of Buffalo. This new type of drive combines the advantages of positive mechanical drive with simplified, safe hydraulic action control. It permits the

press to operate at a rapid speed in the early stages of compression, and at slower speed with increased pressure as the bale nears completion. This also allows bulky material to vent before final compression, making a firmer bale.

Features are: (1) fluid type coupling between motor and speed reducer minimizes shock and permits motor to attain full speed before taking on load; (2) self aligning, dust-proof and grease tight roller bearings; (3) limit controls at top and bottom of travel confine operation to normal cycle; (4) push button safety hydraulic action control (three station); (5) roller chain, tested at several times operation load; (6) smooth, shockless starting and stopping; (7) heavy reinforced welded construction to prevent bulging. Doors reinforced with 6" I beams and equipped with safe-type locking mechanism to prevent opening during operation of bale; (8) pit depth to suit requirements; (9) sliding, rolling door to permit loading from second floor; (10) low starting load electric motors. Hydraulic drive reduces current consumed; (11) fully enclosed, including controls, chains, etc., to prevent personal injury; (12) baler is supported by 2-twelve foot U channels, 12" below floor level—can be hung over a pit or on upper floors.

Direct Acting Flow Rate Regulator

According to the manufacturer, W. A. Kates Co., Deerfield, Ill., design modifications in the Kates Direct-Acting Flow Rate Regulator provide greater accuracy and improved performance on all liquid flow control problems.

Designed for use wherever liquids are handled, the new unit is held to be particularly well-adapted to such jobs as blending and proportioning, solvent extraction, controlling filter effluent, water treatment and deionizing, chemical process control, evaporator influx, diluting of bulk heavy chemicals; and on many other jobs where accurate control of flow rate is desired.

Operation of this is described as simple and trouble-free. Set calibrated dial to desired flow rate and despite pressure fluctuations in either the inlet or outlet lines, regulator will automatically hold flow to set rate. When combined with a centrifugal pump, the regulator will give proportioning control. Action of the regulator is quick and positive, without the hunting or time lags.

Available with standard capacities ranging from 0.1 to 100 g.p.m. of water, accuracy legend is to within +3%. When desired, larger capacities and greater accuracy can be furnished. Installation requires no special tools, and can be made quickly.

Electronic Timer

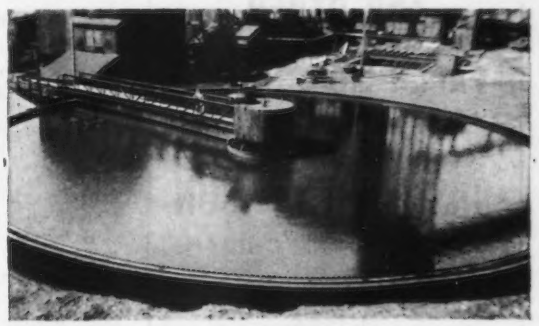
Type 30HL1 is automatic unit for intervals from 1/20 second to four minutes. The product of Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass., it is designed for industrial applications where long life repeat-cycle operation or precise accuracy is a prerequisite.

Described as a universal timer, it provides four basic types of timing: Interval, Delayed Action, Automatic Repeat, and Programming, as well as many variations of these four fundamental types. All these timing combinations may be utilized by merely changing external connections to the terminal board.

Foremost feature is extreme flexibility of the entire unit, though it employs but one vacuum tube and one relay.

CIRCULAR CLARIFIERS

For raw water or "white water" treating. Available in sizes up to 200' diameter, either center-column or beam-supported, for steel, concrete, wood or tile tanks. Bulletin 35-C-14.

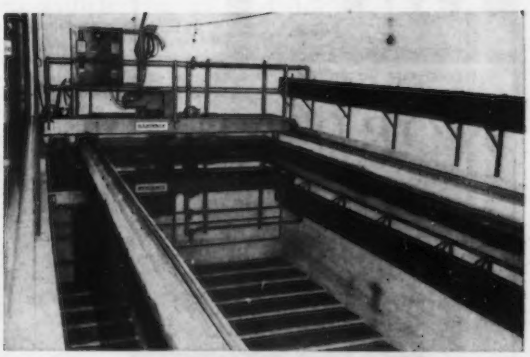


RECTANGULAR CLARIFIERS

For industrial wastes or supply water treatment where space is limited, or where sludge delivery is desired at one end of the tank—the Hardinge Rectangular Clarifier provides a compact, efficient unit. Bulletin 31-D-14.

AUTOMATIC BACKWASH SAND FILTERS

The Hardinge "ABW" Sand Filter cleans itself automatically, without shut-downs or change-over. Adapted to filtering water containing small amounts of suspended particles that cannot be properly collected in clarifiers alone. May be used for paper plant supply water or for recovery of fibre and filler from "white water." Write for Bulletin 46-14.



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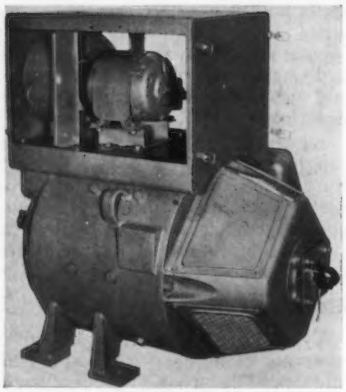


Rapid Reversing Motor

A new d-c motor of low inertia (small diameter armature) and high flux (strong field) designed to meet the extraordinarily fast reversing requirements of the drives for many of today's high production machines is announced by Reliance Electric & Engineering Company, 1088 Ivanhoe Rd., Cleveland 10, Ohio.

Based on the Reliance Type T heavy-duty design, it makes use of two electronic circuits to impose, briefly, several times normal voltage on both motor armature and field. Controlled within pre-determined current limits, these forcing circuits make it possible while maintaining maximum torque to reverse the motor rapidly. Moreover, the consistency of point of reversal is maintained because of a minimum of overtravel, it is stated.

The new motor with its associated generator and electronic controls will be available in sizes from 1 to 500 horsepower. Motors in all sizes are force ventilated with air supplied by an integrally mounted blower.

Shown is a 500-hp. unit, frame 1980-TY, with quick-stopping and fast-starting characteristics developed especially for application on a large deep drawing press.

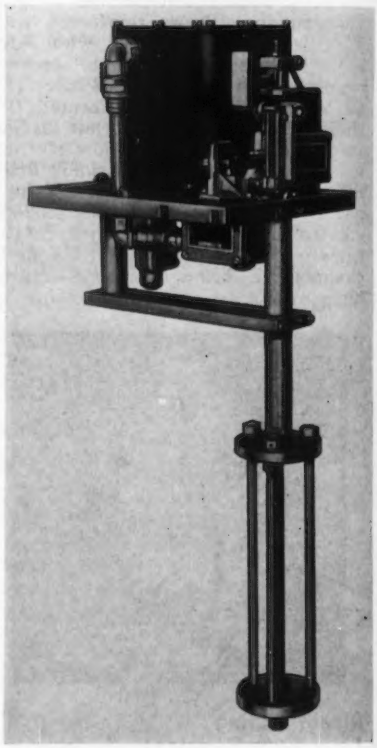
Flame Failure Safeguard

Fireye Flame Failure Safeguard, Type F18T-3, is designed to provide operating flame failure protection for manually-ignited oil burners, air heaters, ovens, kilns, etc., and is used with programming controls to protect automatically ignited oil-burner installations. On existing installations it is readily substituted for slow-acting thermally responsive switches to give increased flame failure protection.

Unit consists of a phototube and amplifying system housed in a dust-tight aluminum case. Special heat-resisting filters and insulating fins serve to insulate thermally the housing from the high furnace temperatures so that the entire control may be mounted directly on the furnace wall.

Other features include a hermetically-sealed time delay element which prevents the flame relay from dropping out from purely transient disturbances; a pilot light to indicate flame failure which can be viewed through an angle of 180°; and a cover switch to prevent unsafe operations of the control should the cover be removed.

Write for Bulletin CA522.



Nonclogging Viscometer

Norcross Corporation, Dept. N 31, 247 Newtonville Ave., Newton 58, Mass., has developed a Viscometer Measuring Element for solutions that build up a coating which normally interfere with the accurate measuring of viscosity by industrial Viscometers. The new model is described as particularly suitable for process control applications where these solutions tend to solidify when exposed to air.

Element is mounted vertically with the liquid level passing through the rod structure. A normal coating on the rod at the surface of the liquid, it is said, will not interfere with the operation of the instrument and this deposit buildup can be easily removed when necessary because of the open construction.

Basic principle of operation is the same as with the company's standard line of instruments. A piston on the lower end of the center rod operates in a cylinder, and a motor cam mechanism at the top of the rod raises the assembly, drawing a sample of the solution into the space within the cylinder below the piston. Assembly is then released. The time required for it to drop and expel the test sample is a measure of viscosity.

The new model can be made of materials and dimensions suitable for the actual application, and it will function with any of the company's existing recording or recording-controlling equipment.

Anti-Static Horn for Fire Extinguishers

A built-in device which grounds static electricity and eliminates shock to operators of Carbon Dioxide Fire Extinguishers having hose connections is announced by American-LaFrance-Foamite Corp., Elmira, N. Y.

Known as Alfco Anti-Statik Horn, it is designed to provide a means of eliminating the building up of a static potential under all operating conditions. A pair of copper conductor strips, extending a considerable distance along the inside surface of the horn, are molded in place and electrically bonded through the nozzle and the metal braid of the hose to the carbon dioxide cylinders. These strips serve to carry away the static charge as rapidly as it is produced.

Small units of 2½ lb., 3⅝ lb. and 5 lb. capacity do not require anti-static strips because the horns are short and the rate of flow is insufficient to cause excessive friction.

Illustrated literature available.

Photomultiplier Attachment

Beckman Instruments, Inc., South Pasadena, Calif., announce the development of a Photomultiplier Attachment that greatly increases the sensitivity of their Model DU Spectrophotometers—particularly in the 200 to 600 millimicron range.

With this attachment, it is now possible to obtain an overall amplification gain from 100 to 1000 times that of the standard ultraviolet sensitive phototube, it is stated. Resolution of the instrument is greatly increased in all spectrophotometric measurements, but particularly in flame, fluorescence, and turbidimetric determinations. Easy interchangeability and push-button control are abtained in operation. The multiplier phototube and a special load resistor are used for all measurements below 600 millimicrons. The red-sensitive phototube, plus another load resistor, is used for analyses above 600 millimicrons.

The attachment consists of an auxiliary battery box equipped with all required dry cell batteries specially-arranged phototube housing containing the 1P28 multiplier phototube. It is easy to install, and no instrument modification is necessary. Write for Data File 16-284.

Low Cost Wet Strength Resin

Rohm and Haas Company, Dept. 7, RG, Washington Sq., Philadelphia 5, Pa., announces the development of Uformite 711, a low-cost modified urea-formaldehyde resin in aqueous solution, designed to impart wet strength to a wide range of paper products.

In addition to wet strength, it is claimed that the resin improves dry tensile, mullen, fold, and pick resistance. Wet rub of starch coatings

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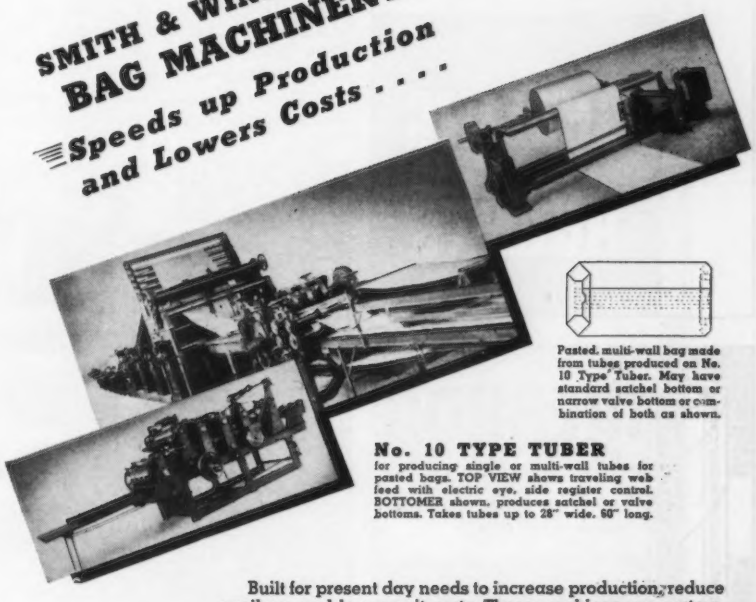
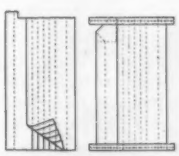
BAG MACHINERY
Speeds up Production and Lowers Costs . . . .



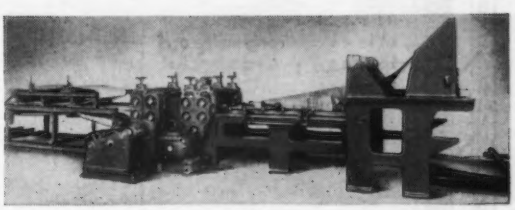
Pasted, multi-wall bag made from tubes produced on No. 10 Type Tuber. May have standard satchel bottom or narrow valve bottom or combination of both as shown.

No. 10 TYPE TUBER
for producing single or multi-wall tubes for pasted bags. TOP VIEW shows traveling web feed with electric eye, side register control. BOTTOMER shown, produces satchel or valve bottoms. Takes tubes up to 28" wide. 60" long.

Built for present day needs to increase production, reduce spoilage and lower unit costs. These machines are custom-made to your requirements and will give continuous, trouble-free service. Increase your profits by speeding up production with Smith & Winchester equipment.



Multi-wall, sewed valve type, gusseted tube made on Smith & Winchester Multi-wall Tuber.



S & W MULTI-WALL TUBER

Up to 100,000 valve notch tubes each 8-hour day may be produced on this Multi-wall Tuber for sewed valve bags. One to 6 walls. Machine built in 2 sizes. 20" and 26" face. Up to 6" gussets. Tubes 26" to 50" long. Improved cross pasting units, photo-electric compensating drives and flying splice paper roll stands can be furnished. If you have a bag problem write us.

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NEW YORK OFFICE—500 5th AVE.

shows significant improvement with the addition of the new resin.

Can be used as supplied without acid treatment or aging, and can be diluted to any desired concentration without loss of stability.

Freedom from sensitivity to sulfate ion is an important feature of Uformite 711, it is stated. Preliminary tests indicate that sulfate ions improve rather than impair the performance of the resin. Similarly, it is not sensitive to the presence of residual bleaching agents — an important factor where free chlorine may be used as slime-control agent.

Although the resin can be added at any point from head box to beater, optimum results are held to be obtained where the resin is added close to the point of sheet formation.

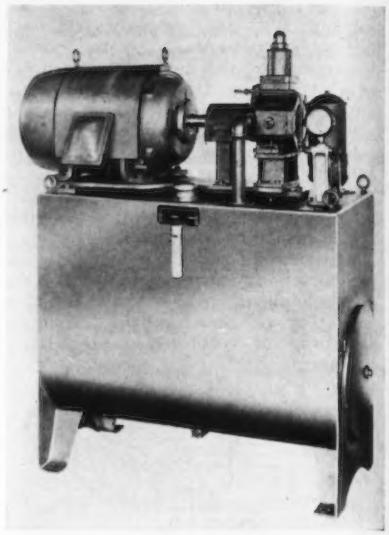
Its cationic nature makes it adaptable to all types of pulp—bleached and unbleached, draft and sulfite, and sulfite-groundwood combinations. Maximum efficiency is noted in unbleached kraft furnishes.

Additional notes, including product and operational data are available.

Drum Pallet

A special pallet for drums is reported to have increased storage capacity of an outside drum storage area 100 percent. Developed by handling engineers at the East Pittsburgh Westinghouse plant, and produced by Baker Rauling Co., Baker Industrial Truck Div., 1230 West 80th St., Cleveland 2, Ohio, the pallet makes it possible to fork truck the drums and stack them four high in the yard.

Large enough to carry four drums at one time, the pallets are built with narrow wood stringers running lengthwise to keep the drums securely in place. Where formerly drums were dumped out of rail cars onto mats, then rolled on planking to the storage area, they are rolled onto these pallets and taken by fork truck to storage where four-high stacking is said to be a cinch.

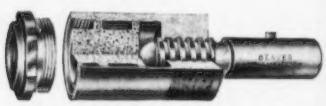


J. I. C. Power Unit

Compact, space-conserving J. I. C. Power Units are manufactured by Superdraulic Corporation, 14256 Wyoming Ave., Detroit 4, Mich., in 30, 60 and 80 gallon standard sizes. The units are assembled with Superdraulic or any other make pump specified by the customer.

In addition to pump, motor, valving, etc., the design features such details as ample floor clearance, large tank clean-outs in both ends, sight gauges, filler and bleeder caps on both ends and oil filters. These units can be readily readily adapted to include special types of equipment to suit individual customer requirements.

With the exception of accessories, the unit is entirely fabricated and assembled by Superdraulic.



Universal Nipple Chuck

A Universal Nipple Chuck (Beaver "55") capable of threading ⅛″ to 2″ pipe has recently been introduced to the market by Beaver Pipe Tools, Inc., 310 Dana St., N.E., Warren, Ohio.

It has but three parts: a polished steel body, a sliding plunger and a hardened steel threaded shank. Nipples are easily removed by hand; no wrenches are required. Adapters allow for all sizes from ⅛″ to 1½″ pipe. (No adapter is needed for 2″ pipe.) An inserted pin retains the sliding plunger in working position.

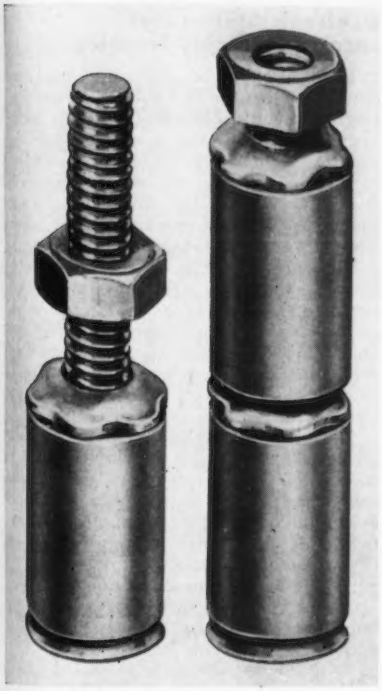
Usable four ways: with a pipe machine, power drive, any pipe vise or a machinist's vise, the new chuck converts short lengths of pipe into useful all-thread, close-thread or average nipples. Optional for the buyer is a heavy gauge sheet metal kit box for carrying chuck and a full range of adapters.

Medium Duty Knife Grinder

Samuel C. Rogers & Company, 183-205 Dutton Ave., Buffalo 11, N. Y., announces the introduction of their latest medium duty knife grinder—the "NL" grinder, an automatic cabinet-base machine particularly adapted to the fast, accurate care of many types of knives. Included in its application are: rag cutter knives, trimmers, light chipper knives, paper and stock cutter knives and many others.

Designed for speed and precision, the unit embodies the latest electric table drive, including Rogers designed special control switches and 1½ hp. special reversing motor. Table speeds are variable and table reversals are smooth and shock free. All grinding pressures are absorbed by the heavy base through the carefully machined combination of flat and angled "V" ways. Because of the reciprocating table action, the "V" ways are self-aligning.

Available in six standard sizes to handle knives up to 60″, 66″, 72″, 90″, 102″ and 110″ in length.



Anchor Bolt Assemblies

Single and double anchor bolt assemblies designed to provide 50 percent greater anchorage have been developed by Super-Grip Anchor Bolt Co., Inc., 3333 North 22nd St., Philadelphia 40, Pa.

Designed for general use wherever greater anchorage is required, the new assemblies can be easily installed. After insertion of the anchor bolt, lead sleeve and patented, cup-shaped steel anchor, a tamping tool mushrooms the lead first. Repeated blows flatten out the steel anchor driving its ribbed steel edges into the walls of the hole. Steel reinforces lead and provides a permanent, solid anchorage that prevents bolts from loosening.

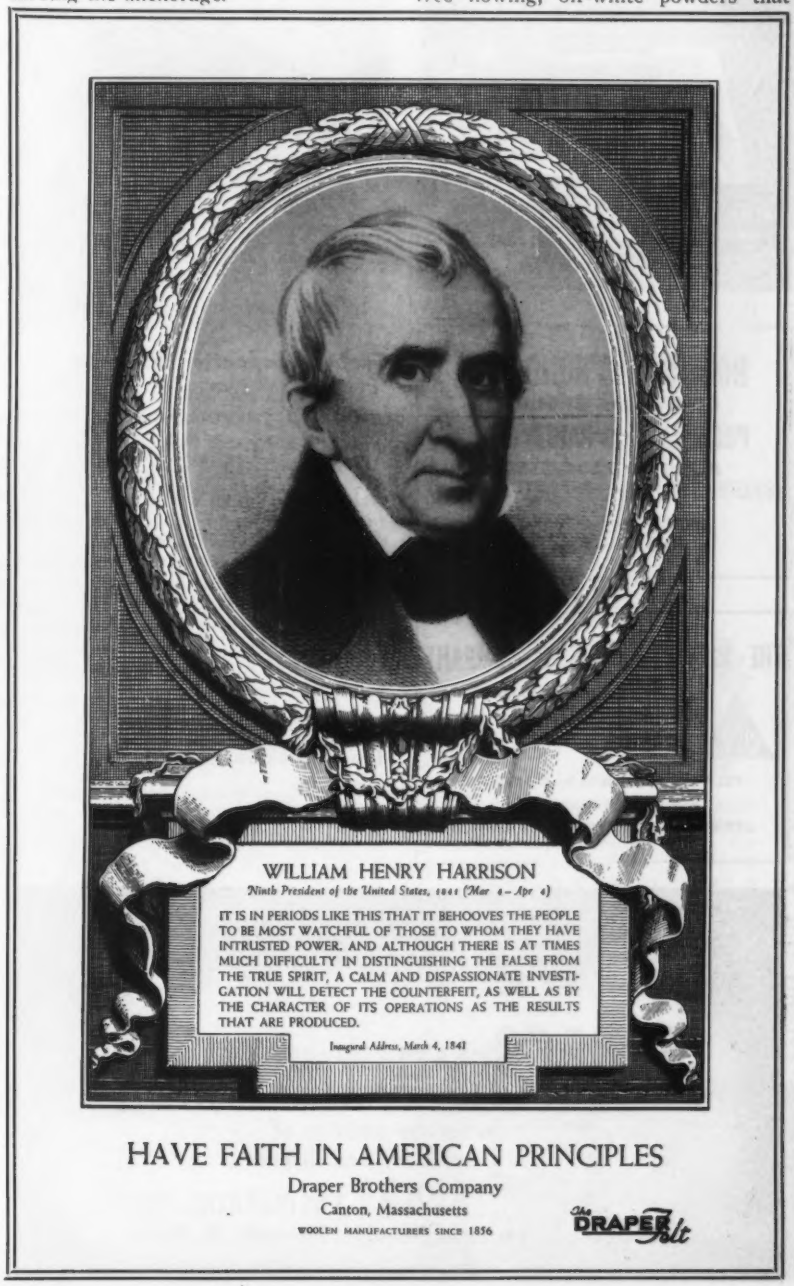
Another feature of the assembly is that the anchor can be put in masonry, brick, wood, at any angle and the bolt can then be bent or off-set without disturbing the anchorage.

Single or double anchor bolt assemblies can be obtained in bolt sizes from 3/16″ to ½″ and up to 5″ long. A tamping tool is provided free with every 100 assemblies.

Modified Styrene Polymer Resins Are Water Soluble

A unique series of water-soluble, modified styrene polymer resins with a variety of applications in the oil, plastics, paper, paint and other industries are announced by Monsanto Chemical Company's Plastics Division, Springfield, Mass.

Designated as the Lustrex X-700 series, the resins are finely-divided, free flowing, off-white powders that


WILLIAM HENRY HARRISON
Ninth President of the United States, 1841 (Mar 4–Apr 4)
IT IS IN PERIODS LIKE THIS THAT IT BEHOOVES THE PEOPLE TO BE MOST WATCHFUL OF THOSE TO WHOM THEY HAVE INTRUSTED POWER. AND ALTHOUGH THERE IS AT TIMES MUCH DIFFICULTY IN DISTINGUISHING THE FALSE FROM THE TRUE SPIRIT, A CALM AND DISPASSIONATE INVESTIGATION WILL DETECT THE COUNTERFEIT, AS WELL AS BY THE CHARACTER OF ITS OPERATIONS AS THE RESULTS THAT ARE PRODUCED.
Inaugural Address, March 4, 1841

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DESIGN, CONSTRUCTION, MODERNIZATION

dissolve readily in water to produce stable solutions covering a wide viscosity range. The solutions are reported stable over a wide pH range, with no appreciable viscosity change from one to 12 pH.

Copies of descriptive bulletin may be obtained from the product development dept.

Surface Inspection Magnifier

Model 220 Magnifier features six power (6x) Achromatic magnification with flat, clear, two-inch field of vision. Produced by Larrimore Sales Co., P.O. Box 1234, St. Louis 1, Mo., it has special application in small parts or surface inspections in printing, paper and textiles, maintenance, first-aid, etc.

Made of laminated plastic with a clear lucite base, unit is portable and carries no light of its own. For most purposes, sufficient light is concentrated on the object from adjacent light sources by the curved side of the lucite base.

Phenolic Resin Coatings for Corrosion Resistance

Ricwilite Coatings are announced as special formulations to protect equipment against extremely corrosive conditions in all types of industry. A tough impervious film which is resistant to attack by acids and alkalies, salt water, rust and weathering, they are manufactured by Ric-wiL Plastic Coatings & Manufacturing Corp., 1290 Euclid Ave., Cleveland 15, Ohio.

Held to be ideal for protection of ventilating and duct systems, drill pipe, piping and equipment in pulp and paper plants, the coatings are available in two distinct types: Ricwilite 1060 is of the baking or heat-hardening type. (When baked at 350° to 400°F., the coating hardens or polymerizes to form a chemically inert, insoluble, corrosion-resistant coating which is hard and tough, glass-like in appearance, yet flexible and plastic.) Ricwilite 7100, a cold-setting type which is cured or polymerized at room temperatures (60°-80°F.) by the addition of a catalyst just prior to application. Can be applied to almost all metals, concrete, wood and plaster surfaces by brush or spray.

Descriptive literature is available.

Electronic Stethoscope Locates Mechanic Troubles

The problem of locating friction noises in bearings, pistons, gears, ratchets, cams, clutches, traps, pipe lines, valves, and other mechanisms is met by a portable, electronic instrument, according to the manufacturers, Anco Instrument Div., American Name Plate & Mfg. Company, 4254 W. Arthington St., Chicago 24, Ill.

Known as the Elec-Detec, this electronic stethoscope employs a metal probe which serves as a microphone to localize the exact source of tell-tale noise, help diagnose the trouble and determine quickly where to make repairs without tearing down the entire equipment, it is stated.

The electric amplifier and the sensitivity control on the instrument make it possible to detect sounds at low speed that otherwise would not be heard only at high speeds. Even the tick of a fine watch becomes audible through this instrument, it is said, while air-borne sounds do not register.

Comes furnished complete with high impedance type headphones, batteries, and leather carrying case.

Concentrated Acid-Proof Hose

Rubber hose developed in the research laboratories of the Hewitt Rubber Division of Hewitt-Robins, Inc., 666 Glenbrook Rd., Stamford, Conn., gives promise of resisting concentrated

SPRACO BATTERY SPRAY MOISTENING EQUIPMENT
for the addition of moisture and chemicals
SPRAY ENGINEERING CO.
121 Central St., Somerville 45, Mass.
Write for new TECHNICAL BULLETIN

organic and inorganic acids, it is stated.

Previous recommendations on the use of hose in conveying acids have been limited to these maximum concentrations: sulfuric 50 percent, nitric 10 percent, acetic 10 percent, hydrochloric 80 percent and hydrofluoric 50 percent. With this new compound, it is believed, these percentages can be raised to 100 percent concentrations, except on nitric and sulfuric which can, however, be recommended for 75 percent for nitric and 98 percent for sulfuric. This compound is also held to withstand the action of fuming nitric over 86 percent if used for intermittent service. The compound is also suitable for chlorine and saturated chlorine water service.

Should the compound live up to expectations it would have widespread use throughout other industries in the form of hose and many other products.

Hard Rubber Pump for Acids, Alkalies

The Ace Jabsco Pump in hard rubber construction for handling acids, alkalies, and other corrosives, is a development announced by American Hard Rubber Company, 93 Worth St., New York 13, N. Y.

Self-priming, the pump will start instantly against suction lifts of 6 ft. without a foot valve. When primed, it will handle suction lifts as high as 14 ft., it is said.

It pumps viscous or thin liquids, it is resistant to alkalies, solutions of metallic salts, inorganic acids, hydrochloric acid any strength—in fact, any liquid that can be handled by neoprene, as the hard rubber casing generally is more resistant than the impeller.

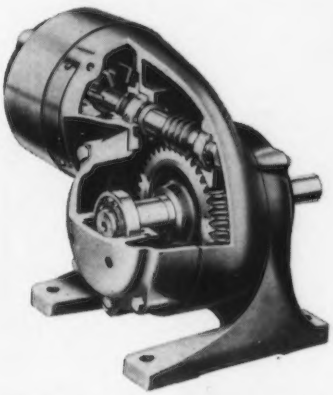
Pump is threaded for ¾" standard pipe threads. It can operate equally well in either direction, reversing flow.

Dehumidifier Offers Automatic Control

The Aqua-Sorber Dehumidifier is rated the first unit to offer automatic control. The product of Walton Laboratories, Irvington, N. J., it is designed for commercial, industrial and resident application.

Held to be first to include an automatic control which is activated by the moisture content of the atmosphere, the new unit operates only when necessary rather than at timed intervals.

Other features include maximum air flow; easy removal of the water container; and a hose connection readily accessible for permanent automatic water removal through drain piping; handy "on-off" switch. Equipped with 1/5 hp. motor which provides 56 percent greater power than the conventional ⅛ hp. motor; unit also is available with or without automatic control.



Right-Angle Worm-Gear Motor

A line of low-speed right-angle worm-gear motors has been placed in production by U. S. Electrical Motors, Inc., P. O. Box 2058, Los Angeles 54, Calif.

Introduced as Type GW Syncrogear, design incorporates a cantilever design to protect gear alignment. Mounting stresses are absorbed by a rugged single unit pyramidal base with "spread eagle" feet. Gear and motor housing are free from distortion. Unit embodies splash lubrication, a hardened and ground worm, leakproof oil seal and asbestos-protected windings. It has self-locking brake action.

Built in speed ranges from 20 to 155 r.p.m. and gear ratios up to 58:1, horsepower ranges from ¼ to 3, the motor is made in both 3-phase and single phase. Can be installed horizontally or upright, and can be provided with a footless flange mounting. Other modifications provide variable speed, splashproof design and total enclosure.

Ask for Type GW Syncrogear Bulletin No. 1650.

Multiple Type Purge Meter

A multiple tube purge meter in a single integral unit is announced by Brooks Rotameter Company, Box 432, Dept. CD, Lansdale, Pa. Available in two, four, or six tube units, the plastic rotameter replaces a similar number

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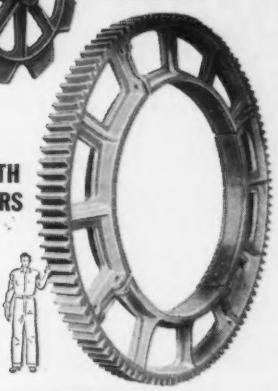
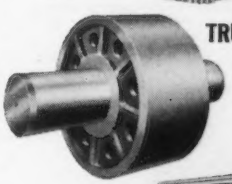
Stroh
WEAR-RESISTANT
Replacement Parts
for
Kilns Rod Mills Compeb Mills
Coolers Tube Mills Crushers
Dryers Ball Mills Classifiers
other similar equipment

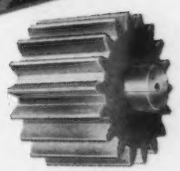
SPROCKETS



GIRTH GEARS



TRUNNIONS



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of single tube meters or bubblers for metering and regulating small flows of liquids or gases.

All of the metering tubes and piping connections are precision-bored in a block of acrylic plastic, a construction which eliminates packing glands and breakable glass tubes. The meter is available with either common manifold inlet for all the metering tubes or individual inlets as desired. Rate of flow adjustment is made with separate Flo-Mite needle control valves for each tube. In addition, a standard bezel is obtainable for flush panel-mounting of any of these meters.

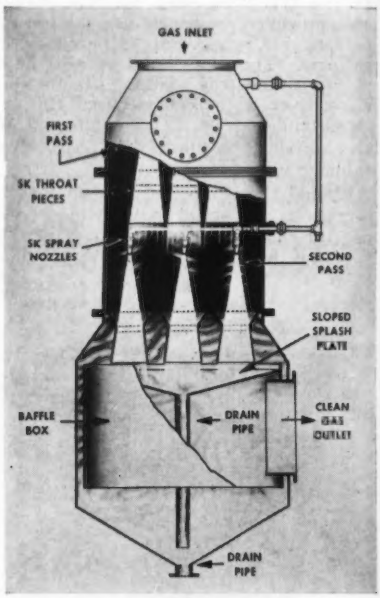
Ask for Bulletin 120.

Temperature Regulators Self-Operated

Series "V," a new line of self-operated Temperature Regulators, has been announced by the Farris Stacon Corporation, 524 Commercial Ave., Palisades Park, N. J.

Designed in either direct or reverse acting types for heating and cooling applications, the units operate on the simple principle of liquid expansion. Since the liquid expansion is proportional to increments of temperature, the valve movement is gradual. The result is a gentle, but positive, throttling, where the valve supplies only enough steam or cooling medium to maintain the desired control temperature.

Available in sizes ranging from ¼" to 4", the regulators are designed to control temperatures between 25°F. and 275°F., with a 50°F. range of adjustment. Their inlet pressure limit is rated 125 p.s.i.g. and inlet temperature limit is 450°F. They are constructed with bronze bodies, renewable bronze or stainless steel seats and discs and have an 8′ nickle plated copper capillary and nickle plated brass bulb standard.



Packaged Gas Scrubber

A "packaged" Gas Scrubber Unit which washes gases and fumes is announced by Schutte and Koerting Company, Cornwell Heights, Pa.

Claimed for the unit is that it will handle gas containing wettable solids and condensable gases, as well as gases and solids which can be cleaned by obtaining a chemical reaction between the gas or solids and selected spray liquid. In the case of gases containing non-wettable solids or dust — carbon black or metal oxides for example — a suitable wetting agent can be introduced into the spray liquid.

In operation, the gas enters the scrubber through an inlet pipe. The suction action of the spray from the nozzles draws the gas into the throat pieces of the first bank in the scrubber, where the liquid and gas are thoroughly mixed. The mixed gas and liquid is discharged into another bank of spray nozzles and throat pieces. As the gas enters each bank it is entrained and forced through the throat pieces. When the gas leaves the last bank of nozzles and throat pieces, it is washed, cooled and discharged through an outlet pipe. The number of banks, nozzles and throat pieces per bank are determined by the volume and characteristics of the gas and the scrubbing efficiency desired.

Excellent Program at Northwest

The Northwestern Division of American Pulp and Paper Mill Superintendents Assn., Inc., held their fall convention on September 12 and 13, at Northland Hotel, Green Bay, Wis.

Attendance was approximately 225.

Abstracts of the Saturday talks are:

Consistancy, the True Value of Paper to the Printer

Don Steinback, printing engineer, Miles Kimball Co., Oshkosh, gave an interesting discussion on how the various properties of paper affect the printer's operation.

After breaking the printing trade down into four major groups: (1) Factory or Converter Printer, (2) Publication Printer, (3) Commercial Printer, (4) Job Printer, Mr. Steinback said that each is affected in different ways because of the demand of his type of printing.

He cautioned the papermaker on holding all properties of the paper to as close tolerances as possible but above all to try to maintain consistency in the product. The printer can adjust his press to handle nearly all kinds of printing paper but cannot continue to do a good job if the paper qualities fluctuate wildly.

Protective Coatings for Pulp and Paper Mills.

R. R. Kelly, Progress Paint Co., Wausau, discussed the role of protective coatings in the pulp and paper mill.

A protective coating affords protection to both buildings and equipment against corrosive conditions. He mentioned metals and masonry and emphasized the protection of the product from contamination through the use of these coatings. Heat reflection and decorative needs are also met. These plastic coatings have been developed within the last 15 years and many of them within the last year.

He advised that the coating supplier needed the following information before recommending a coating: (1) Type of Surface, (2) Use of Equipment, (3) Type of Exposure, (4) Type of Chemicals, (5) Concentrations, (6) Temperature Ranges, (7) Length of Time of Exposure, and (8) Abrasion.

In making a selection of a coating, the mill should ask the manufacturer for: (1) Application Instructions, (2) Cost, (3) Film Thickness, (4) Case History of Coating in Like Conditions, (5) Anticipated Life, (6) Test Rods and Samples for Actual Testing in the Plant.

He also mentioned that cost should be figured per year of coverage rather than by initial cost.

Surface preparation is very important in using any of these plastic coatings. The surface can be cleaned by: (1) Sand Blasting, (2) Flame Cleaning, (3) Pickling, (4) Steam Cleaning, (5) Wire Brushing, (6) Metal Preparation Solutions, (7) Chemical Cleaning. Sand blasting being number one in importance and should be used wherever possible to do so. It not only cleans but roughens the surface which forms an excellent receiving surface for the prime coat.

Application ranks next in importance and a trained man should do the job. It is important that pin holes be entirely eliminated. Using different shades in the coats applied will help eliminate this problem. The prime coat is most important of the usual 3 coats applied and should be applied immediately after cleaning is completed.

The thickness of the coating is very important. The best for ordinary exposure risks is about 3 mils. On extreme risks heavier coatings should be applied.

After coatings are put on a follow-up schedule should be instituted to touch-up any breaks in the surface.

Some Hows, Whys and Wherefores in Developing Industrial Personnel

King Evans emphasized industrial training programs, specifically mentioning the War Manpower programs of J.I.T. (Job Instruction Training, J.M.T. (Job Methods Training), and J.R.T. (Job Relations Training). Success of program is based on: (1) Enthusiasm of Top Management, (2) Program Tailored to Suit Need of Plant, (3) Good Teachers, and (4) Follow-up Through Repetition and New Approaches.

Labor Relations 1952

V. G. Cornelius gave short sketch of duties of his association and then told various factors affecting labor relations. Predicted steel settlement influence on future labor contracts. Reviewed the steel strike and negotiations in detail.

The chart shows changes in average hourly earnings by selected industries.

Of the technical discussion group meetings the Sulphite and Papermaking groups had the best attendance and liveliest discussions. In fact, the papermakers hardly got adjourned before the evening cocktail party.

Fred Boyce, president, D. J. Murray Co., grand-daddy of the Superintendents Assn., inducted Rev. Basil Reuss, the luncheon speaker, into the select order of "Chinese Hand Made Papermakers" with appropriate ceremony immediately following Rev. Reuss' talk.

PULP AND PAPER MANUFACTURERS ASSOCIATION
(Lake States)
CHANGES IN AVERAGE HOURLY EARNINGS
1939 to May 1, 1952

	Average for 1939	Average at 5/1/52	Total Increase 1939 to 5/1/52	Percent Increase 1939 to 5/1/52	Rank
Lumber & Wood Products (Except Furniture)	$.489	$1.465	$ .976	199.6%	1st
Textile Mill Products	.460	1.347	.887	192.8%	2nd
Furniture & Fixtures	.518	1.468	.950	183.4%	3rd
PAPER & ALLIED PRODUCTS	.592	1.587	.995	168.1%	4th
Chemicals & Allied Products	.649	1.710	1.061	163.5%	5th
Food & Kindred Products	.607	1.563	.956	157.5%	6th
Stone, Clay & Glass Products	.637	1.604	.967	151.8%	7th
Tobacco Manufactures	.476	1.195	.719	151.1%	8th
Leather Products	.528	1.319	.791	149.8%	9th
Primary Metal Industries	.739	1.840	1.101	149.0%	10th
Machinery (Except Electrical)	.746	1.840	1.094	146.6%	11th
Electrical Machinery	.702	1.695	.993	141.5%	12th
Printing & Publishing	.866	2.058	1.192	137.6%	13th
Fabricated Metal Products	.727	1.719	.992	136.5%	14th
Rubber Products	.754	1.779	1.025	135.9%	15th
Apparel & Related Products	.527	1.241	.714	135.7%	16th
Products of Petroleum & Coal	.894	2.023	1.129	126.3%	17th

Source: Survey of Current Business, U. S. Dept. of Commerce.

PRICES

The prices below reflect market quotations in New York at the mill level on standard grades. Does not include spot offerings.

PAPER AND BOARD

Standard News, Delivered Ports

Rolls, contract, per ton	$116.00/$126.00
Sheets	131.00/ 147.50

Kraft—per cwt. 50# base wgt. OPS Ceiling CPR 88

F.o.b. Southern & Western integrated mills. Cl. Freight allowed up to $10 a ton.

Standard Wrapping, ctr. rolls	$7.75/ —
Butchers, counter rolls	8.25/ —
Standard Bag, mill rolls	7.50/ —
Shipping Sack, mill rolls	7.75/ —
Gumming, mill rolls	8.00/ —
Asphalting, mill rolls	7.75/ —
Envelope, Sub. 20, mill rolls	9.25/ —

Tissues—per ream 24x36 (480) 10 lbs. 2500 lbs.

Wh. No. 1 Frd.	$1.90/ —
Wh. No. 1 MG	1.90/ —
Wh. No. 1½	1.75/ 1.80
Wh. No. 2	1.50/ 1.60
Kraft Anti-Tar 20-30	1.75/ 1.80
White Anti-Tar 20-30	2.20/ —

Toilet— per case of 100 rolls—1M sheets

Unbleached 4½x4½	$8.00/$8.25
Unbleached 4½x5, 650 sheets	6.65/ —
Bleached 4½x4½	10.00/12.50
Bleached 4½x5	9.81/10.14
Per Case of 50 rolls—2000 sheets	
Unbleached 4½x4½	$8.00/$9.75
Bleached 4½x4½	6.95/ —
Per Case of 100 rolls—1000 sheets	
Facial, 4½x4½, 2 ply	$8.95/10.37
4½x5, 2 ply	10.25/10.75

Paper Towels—per case of 3750

Wh. Jr. M'tif'd 9⅛x9¼	$6.40
Br. Sr. M'tif'd 9⅛x12	4.40
Br. Jr. M'tif'd 9⅛x9⅜	3.90
Br. Jr. Sgl. fold 9⅜x10¾	3.95
C-Fold 10¼ min. x 14 max.	5.90/ 6.64
Blchd. 7½x11, 48/50 rolls	6.80/ 7.92

Manila, per cwt.

No. 1 Jute Tag, 100-lb., sheets	$19.55/21.55
Reg. Jute M.F. 40-lb., sheets	18.50/20.50
Printing Manila	12.00/ —

Gummed Tape—per bdl., 500 bdls. or more

90-lb. 375 ft. GSI	$7.20 / —
60-lb. 600 ft. GSI	7.20 / —
35-lb. 800 ft. GSI	8.28 / —
35-lb. 500 ft. GSO	6.21 / —

MARKET WOOD PULP

Third Quarter Contract Prices, Per Short Air-Dry Ton

	Varying freight allowances		On Dock Atlantic Ports		
	*U.S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$87.00/ 92.50*	$70.00/ 90.00			$80.00/ 85.00
Sulfate, Bleached	142.00/152.50	150.00/160.00	$140.00/150.00		
Semi-bleached Sulfate	140.00/ —				
Sulfate, Unbl.	100.00/125.00	100.00/135.00	115.00/120.00	$105.00/135.00	$125.00/ —
Sulfite, Blchd.	140.00/ —	140.00/150.00	140.00/145.00	140.00/ —	140.00/150.00
Sulfite, Unblchd.	125.00/132.50*	140.00/ —	125.00/135.00	125.00/ —	130.00/ —
Sulfite, Unbl'd (Glassine)	132.50/ —	144.00/ —			
Soda, Blchd.	140.00/ —	145.00/ —	130.00/ —		
Sulfite Screenings	72.50/ —				
Sulfate Screenings	67.50/ —				
Groundwood Screenings	60.00/ —				
Unblchd Sulfate Sideruns	132.50/ —				
Stand. News. Sideruns	92.50/ —	85.00/ —			

* OPS Ceiling, CPR 49 ‡ F.o.b. Shipping Point.

Boards Deld., per ton (10 tons or over)

Filled News	$90.00/ —
Plain Chip	90.00/ —
Blchd. Mla. L-d. Chip	140.00/142.50
White Pat. coated .020	160.00/162.50
Kr. Liner 42 lb. M sq. ft. $2.47	117.50/ —
Kr. Corr. .009 M sq. ft. $1.59	122.50/ —
Binders Boards	133.00/ —

The following prices are representative distributors' resale prices:

Rag Content Bonds and Ledgers—
White, 20 lb.

Bonds	4-Ctns.
	per cwt.
100% Rag. Ex. No. 1	$70.45/$75.90
100% Rag	62.65/ —
75% Rag	48.15/ —
50% Rag	38.90/ —
25% Rag	31.65/ 33.00

Ledgers	4 Ctns.
	per cwt.
100% Rag Ex. No. 1	$72.65/$72.80
100% Rag	63.90/ —
75% Rag	49.40/ —
50% Rag	40.20/ —
25% Rag	33.00/ 34.30

Sulphite Bonds and Ledgers
White, 20 lb.

Bonds	4 Ctns.
	per cwt.
Watermarked	$19.00/$20.50
Plain	18.40/ 19.50

Ledgers	4 Ctns.
	per cwt.
Watermarked	$20.30/$21.80
Plain	19.35/ 20.80

White Book

Conversion Coated	Case
	per cwt.
No. 1	$23.90/$24.65
No. 2	22.40/ 22.85
Machine Coated	
Extra No. 1	$21.35/$21.65
No. 1	19.15/ 19.65
No. 2	16.65/ 17.40
Uncoated	
No. 1 Antique (Watermarked)	$19.15/$19.65
Offset	18.15/ 19.15
A Grade E. F.	18.40/ 18.65
A Grade S. C.	18.90/ 19.15
B Grade E. F.	17.40/ 18.15
B Grade S. C.	17.90/ 18.65

‡ Indicates a price change.

WASTE PAPER MARKET

Prices to mills, per ton, f.o.b. cars shipping point (includes brokers' fee.) These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. See TRENDS.

	New York Sept. 12	Philadelphia Sept. 8	Boston Sept. 6	Chicago Sept. 4
No. 1 Mixed Paper	$7.00/ 10.00	$7.00/ 9.00	$7.00/ —	$10.00/ —
No. 1 News	15.00/ 16.00	14.00/ 15.00	15.00/ —	15.00/ —
Over-issue News	20.00/ 22.00	21.00/ —	12.00/ 14.00	18.00/ —
Mill Wrappers	7.00/ 8.00	10.00/ 12.00	13.00/ 19.00	13.00/ —
Corrugated Containers	17.00/18.00	13.00/ 14.00	18.00/ 19.00	20.00/ —
Double Kraft Ld. Corr. Cuts	35.00/ 45.00	30.00/ 40.00	25.00/ 40.00	35.00/ 40.00
100% Kraft Corr. Cuts	45.00/ 55.00	40.00/ 55.00	35.00/ 45.00	55.00/ —
Used Sugar & Flour Bags	35.00/ 45.00	25.00/ 30.00	25.00/ 35.00	30.00/ —
Super Resorted Br. Kraft	45.00/ 50.00	25.00/ 35.00	20.00/ 35.00	30.00/ —
New Br. Kraft Env. Cuts	75.00/ 80.00	65.00/ 70.00	55.00/ 65.00	60.00/ —
New Br. Kraft Cuts	65.00/ 70.00	55.00/ 65.00	45.00/ 55.00	55.00/ —
No. 1 Gdwd. Shvs.	20.00/ 30.00	15.00/ 25.00	28.00/ 30.00	25.00/ —
White Newsblanks	65.00/ 75.00	65.00/ 75.00	40.00/ 50.00	50.00/ —
No. 1 Flyleaf Shvs.	40.00/ 50.00	25.00/ 35.00	25.00/ 42.50	30.00/ —
No. 1 Soft Wht. Shvs.	75.00/ 85.00	65.00/ 70.00	75.00/ 85.00	75.00/ —
Super Soft Wht. Shvs.	85.00/ 95.00	70.00/ 75.00	95.00/100.00	85.00/ —
Hd. Wht. Shvs.	95.00/100.00	90.00/105.00	85.00/100.00	90.00/ —
Hd. Wht. Env. Cuts	120.00/130.00	110.00/120.00	105.00/120.00	100.00/ —
New Manila Env. Cuts	65.00/ 72.00	60.00/ 75.00	60.00/ 70.00	40.00/ —
Col. Tab. Cards	55.00/ 65.00	43.00/ 48.00	40.00/ 50.00	50.00/ —
Manila Tab. Cards	75.00/ 85.00	60.00/ 70.00	60.00/ 65.00	65.00/ —
No. 1 Mixed Ledger	45.00/ 50.00	45.00/ 50.00	35.00/ 45.00	50.00/ —
White Ledger	60.00/ 65.00	60.00/ 65.00	55.00/ 60.00	65.00/ —
No. 1 Book & Mag.†	16.00/ 18.00	18.00/ 24.00	18.00/ 28.00	15.00/ —
No. 1 Rep'd. Hvy. Books‡	26.00/ 35.00	30.00/ 35.00	30.00/ 37.50	27.50/ —

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% groundwood. § Deld.

RAG MARKET

New Domestic Cotton Cuttings
OPS Ceiling Price, CPR 28 *
Delivered Mill Basis

No. 1 White Shirts	$17.00/$21.00*
No. 1 Unblchd. Muslins	18.50/ 21.00*
Blchd. & Unblchd. Underwears	17.00/ 21.00*
Blchd. Canton Flannels	15.50/ 21.00*
No. 1 Light Silesias	13.25/ 16.00*
No. 1 Light Prints	8.75/ 11.50*
No. 1 Blue Overalls	11.75/ 14.50*
Suntan Khakis	9.00/ 11.50*
Fancy Shirts	7.75/ 10.00*
Indigo Blues	7.50/ 10.00*
Mixed Khakis	6.00/ 8.00*
Corduroys	7.00/ 8.00*
Cottonades	6.75/ 8.00*
No. 1 Washables	5.25/ 6.50*

Old Domestic Cotton Rags
(Prices to Dealers, f.o.b. Ship. Pt.)

	Per 100 lbs.
Mixed White	$3.50/$4.50
Cotton Pants & Overalls	3.00/ 4.00
Thirds and Blues, Repacked	2.50/ 3.00
No. 1 Roofing Rags	1.00/ 1.10
No. 2 Roofing Rags	.90/ 1.00

Bagging
(Prices to Dealers, F.o.b. N. Y.)

	Per 100 lbs.
Foreign Gunny	$5.00/$5.25
Heavy Wool Tares	5.00/ 5.25
Foreign Scrap Burlap	4.25/ 4.50
Austr. Wool Pouches	6.00/ 7.00
Domestic Manila Rope	7.00/ 7.50
No. 1 Sisal Strings	6.50/ 7.50

COTTON LINTERS

Memphis Market
F.o.b. Oilmills

		cents per lb.
Grade 2	1st cut	13.00/ 12.00
3	1st cut	11.50/ 10.00
4	1st cut	9.25/ 8.25
5	1st cut	7.75/ 6.50
6	2nd cut	6.00/ 5.50
7	2nd cut	5.50/ 5.50

PRICES OF MATERIALS

Aluminum sulfate:		
coml. bags, wks.....cwt.	**1.65**	
iron-free. c.l.	**3.25**	
Alcohol, ethyl:		
tax free, dms. c.l.....gal.	**1.01**	**/ 1.05½**
deld. East Miss.		
Alcohol, methyl:		
Synthetic, Zone 1, dms.		
c.l. fit. alld.....gal.	**.44**	
Casein, acid prec.:		
dom. sh. pt. c.l. .....lb.	.28	/ .38
imp. ex. dock .....lb.	.19½/	.24
Caustic soda:		
c.l. wks. solid, 76% cwt.....	**3.35**	
flak. & grd. 100-lb. drums...	**3.75**	
liquid 50% tanks....	**2.55**	
liquid 70% tanks....	**2.65**	
China clay:		
dom. air-float, c.l. wks.....ton	10.00	
water-washed, lump, filler....	**11.00**	
coating	**17.60**	**/30.50**
imported, ex whse...short ton	**15.20**	**/28.35**
Chlorine:		
single-unit tanks, works..cwt.	**2.70**	
multi-unit .....cwt.	**3.20**	**/ 4.40**
Formaldehyde:		
USP, inh. dms, c.l. wks....lb.	**.0625/**	**.0675**
l.c.l.. E. wks.....	**.0675/**	**.0725**
Fuel oil:		
Bunker C, No. 6 hvy. tanks, N.Y. harbor .....bbl.	2.10	/ —
light, tanks, refinery .....bbl.	2.00	/ 2.25
Hydrogen peroxide:		
USP, 35% cbys. E. of Miss. lb.	**.23½/**	**.26½**
Lime:		
hydrated, bags, wks. .....tons	**13.50**	
Rosin:		
B gum, drms, c.l. Savan..cwt.	**7.00**	**/ —**
K, M, N .....cwt.	**7.33**	**/ 7.36**
FF, wood, do. .....cwt.	**4.31**	**/ 6.30**
Rosin size:		
70%, gum & pale grds, tank cars, south, sh. pt.....cwt.	**6.25**	**/ 6.30**
Salt cake:		
dom. bulk, c.l. wks.....ton	**17.00**	
wks. frt. all.....ton	**20.00**	**/22.00**
Soda ash:		
light, 58%, bags, wks.....	**1.50**	
bulk .....cwt.	**1.20**	
Sodium silicate, 40°:		
turbid. c.l. wks.....cwt.	**1.30**	**/**
l.c.l. wks.	**1.60**	**/ 1.85**
Sodium peroxide:		
dms. c.l. E. of Miss.....lb.	**.21**	
l.c.l. do. .....lb.	**.21½/**	**.22**
Soybean, protein:		
chem. isol, wks, c.l., bags..lb.	.23½/	.24¼
Sulfuric acid:		
60° Be. cbys. c.l. wks.....cwt.	**1.75**	**/ —**
l.c.l. wks. .....cwt.	**2.05**	**/ 2.85**
Sulfur:		
crude, c.l. mines, contract, long ton	**21.00**	**/22.00**
f.o.b. vessels Gulf	**22.50**	**/23.50**
Sulfur dioxide:		
liquid, coml. cyl. wks.....lb.	**.09**	
multi-unit cars .....lb.	**.0535**	
Starches:		
pearl corn, bags, c.l. wks...cwt.	**6.59**	**/ —**
white dextrines, c.l. wks...cwt.	**7.97**	**/ —**
potato, Idaho, c.l. wks....cwt.	.08½/	—
potato, Maine, f.o.b. wks...cwt.	.10½/	—
potato, imported O.D. ...bags	.087	/ .0875
Talc:		
domestic, sacks, c.l. wks...ton	25.00	/30.00
Titanium dioxide:		
anastase, c.l. deld., bags...lb.	**.21**	**/ .21½**
l.c.l. deld. .....lb.	**.22**	**/ .22½**
rutile, c.l. deld. .....lb.	**.23**	**/ .23½**
l.c.l. deld. .....lb.	**.24**	**/ .24½**

PAPER TRADE JOURNAL SUPPLIERS

J. W. Couture

BLACK-CLAWSON CO., Hamilton, Ohio, has recently promoted J. W. (Walt) Couture to the position of Northeastern sales manager. In this new capacity Mr. Couture will represent and supervise the sales of the products of all divisions of the company. The Northeastern territory includes all of New England plus New York, New Jersey and Pennsylvania. Hence, Mr. Couture will continue to headquarter at the Dilts Machine Works Division office, where he has served as chief engineer since 1940. District sales engineers, A. J. Felton, Jack McKela and W. T. Schick will continue to serve their respective districts in the Northeastern territory under Mr. Couture's supervision.

PANDIA INCORPORATED, successors to Paper and Industrial Appliances, celebrates its 20th anniversary on September 20. Founded by R. D. Kehoe, who served as president until his death in 1949, its activities in the paper industry are now carried on by A. Whittemore, president; L. W. Durant, vice-president; and R. G. Goodwin, director of sales and engineering.

JOHN W. BOLTON AND SONS, INC., Lawrence, Mass., announce that Samuel E. Crocker, Jr., has accepted a new position with the company as sales manager of the Bolton and Emerson Divisions under A. C. Clarke, vice-president.

PENNSYLVANIA SALT MANUFACTURING CO. has appointed James M. McWhirter, formerly Southern Works manager, manager of the Wyandotte Works. He replaces G. A. Nelson, who, because of his wide background and experience in electrochemical engineering, is being assigned to general engineering and consultative work in connection with Pennsalt's current expansion and plans for future developments.

Herman J. Eichenhofer, formerly assistant superintendent at Wyandotte, has been named superintendent of Pennsalt's new electrolytic chlorine, caustic soda and hydrochloric acid plant, now under construction at Calvert City.

J. T. Gormally, formerly superintendent of the Cornwells Heights plant, was appointed assistant to the production manager and will make his headquarters in the Philadelphia office. Frank J. Power, assistant superintendent, becomes acting superintendent at Cornwells Heights.

Carl Thumin

E. P. LAWSON CO., New York, manufacturers of paper cutting machines and bindery equipment, have named Carl Thumin manager of the Manufacturing Division.

TAYLOR INSTRUMENT COS., Rochester, N. Y., has appointed Albert C. Mahana manager of sales to the paper industry. He will also be in charge of sales to the refrigeration and lumber industries.

Mr. Mahana came with the organization in 1944. After a training period at the home office, he served as an industrial sales engineer in both the Pittsburgh and Syracuse territories. He succeeds Clayton D. DeMers, who has retired after 24 year of service with the company.

DIAMOND ALKALI CO. has announced effective November 1, Earl J. Mills will become manager of the Chicago branch sales office, succeeding the late Charles W. Klaus, and John W. Kennady will be manager of the Southwest District sales office, which has its headquarters at Houston, Tex.

It will speed the reply to your inquiry to mention Paper Trade Journal.

OBITUARIES

John Robert Duncan, 52, of Chicopee Falls, died in Springfield, Mass., September 10. He was a salesman for the White & Wyckoff Paper Co.

Russell McCandless, 62, passed away September 5, at the Lawrence Hospital in Bronxville, N. Y., after a short illness. He was in the pulp business for more than thirty years and was well known in the pulp and allied trades.

Charles M. Barr, 32, manager of the Stanford Paper Co. Mill Order Department, died September 6.

Charles Barr's first and only civilian job was with Stanford Paper Co., which he joined on June 23, 1941. From 1942, to 1945 he served in the Army Transport Corps in this country, England and France. On his discharge he returned to Stanford.

He is survived by his brother, Allan, of Holyoke, Mass., and his father, Charles H. Barr, who will be remembered by many in the graphic arts industry as advertising manager of the Chemical Paper Co. for many years, now semi-retired and living at Easton, Md.

AMERICAN PULP AND PAPER ASSOCIATION'S PAPER PRODUCTION RATIO REPORT

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

1952	Aug. 9 88.1	Aug. 16 86.5	Aug. 23 87.9	Aug. 30 84.5r	Sept. 6 64.6
1951	Aug. 11 100.1	Aug. 18 97.1	Aug. 25 97.9	Sept. 1 94.5	Sept. 8 78.8

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1951	99.3	101.3	101.9	102.8	102.2	100.1	88.6	97.7	94.3	100.3	98.0	90.0	98.0
1952	97.1	97.8	95.1	90.6	89.4‡	88.7‡	75.5‡	86.7‡					

COMPARATIVE YEARLY SUMMARIES

	1945	1946	1947	1948	1949	1950	1951	1952
Year to Date	87.8	99.9	103.3	96.9	85.5	94.7	99.3	90.8
Year Average	85.4	96.9	101.7	92.1	83.7	95.8	98.0	

‡ Preliminary.
r Revised.

PAPERBOARD OPERATING RATIOS†

1952	Aug. 9 89	Aug. 16 89	Aug. 23 88	Aug. 30 90	Sept. 6 72
1951	Aug. 11 94	Aug. 18 93	Aug. 25 94	Sept. 1 93	Sept. 8 71

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1951	102	105	104	105	104	103	84	94	86	87	82	75	94
1952	81	86	85	82	82	82	71	89					

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

Note: In the above tables *all* the ratios shown are on the basis of a normal 6 and 7 day capacity.

† Per cents of operation based on "Inch-Hours" reported on a 6-day basis to the National Paperboard Association.

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Every casting is custom produced, whether it be 3" or 54" in diameter, or up to 327" in length.

Our metallurgical experience can be valuable to you. Quality is assured by modern, accepted laboratory testing procedure, careful production controls, the use of highest quality non-ferrous alloys best suited to the requirements of the application, and by the casting method itself.

Centrifugal casting has been proved best because it produces fine-grained castings free of the flaws common to conventionally made castings. Worries over sand inclusions, blow holes, voids, or dross metals are minimized and you get a strong, uniform casting that will give better service with greater economy.

Specify "Chief Sandusky" to your machine builder. He will be glad to supply this quality product.

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exporters of wood pulp
to all world markets

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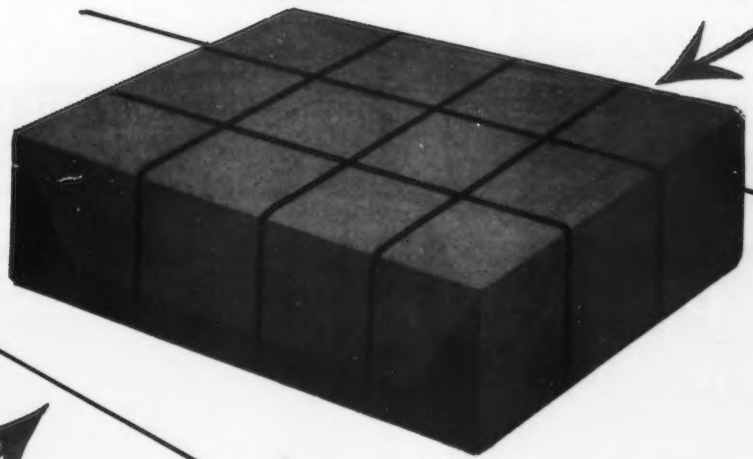
paper exporters
wood pulp



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- REDUCES STRAIN ON SYPHON PIPE AT STEAM JOINT BY REDUCING WEIGHT & LEVERAGE.
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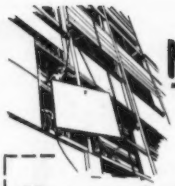


NEW CONSTRUCTION? EXPANSION?

You can build quickly, at low cost, with MARIETTA PRECAST CONCRETE WALL PANELS

MARIETTA concrete wall panels offer real cost savings—up to 30%—when used in place of usual 12-inch masonry walls. Permit fast erection any month of the year. Add seven inches of floor space around entire building perimeter. Have compression strengths of 4,000 psi. Insulated panels have U-value of 0.14, surpassing 12 inches of brick wall. If you're considering a new plant or expansion of existing facilities, let MARIETTA engineers show you how to build permanent, modern, low cost buildings in a hurry with MARIETTA solid or insulated precast concrete wall panels.

MODERN STORAGE

MARIETTA industrial storage systems offer low cost, labor-saving, large capacity facilities for all your bulk raw materials. MARIETTA concrete silos are designed and erected right, in sizes and arrangements to meet your requirements, will protect materials stored from fire, acid, moisture and air. Write for full details . . . TODAY.

The MARIETTA CONCRETE Corporation
MARIETTA, OHIO
BRANCH OFFICES: 509 FIFTH AVENUE NEW YORK 17, N. Y. PULASKI HWY. AT RACE RD BALTIMORE 21, MD.

PRICE & PIERCE LTD.

Wood Pulp and Paper Agents

60 E. 42 ST., N. Y. 17

HANDLING THE SLURRY WITHOUT A WORRY—

THIS "Buffalo" NO. 4

FULL BALL BEARING STOCK PUMP

Handling 500 gpm of slurry is no job for a pump that can't stand up! And "Buffalo" Class "CL" Pumps like the above ARE standing up as they handle slurry—caustic—clay—milk of lime—stocks up to 5% consistency. Why? They have a stuffing box that is extra deep. Their husky over-hung impeller is rigidly supported by properly spaced ball bearings. The casing has renewable wearing rings. WRITE FOR BULLETIN 953-G, and see further engineering reasons why these "Buffalo" Stock Pumps give dependable service.

"Buffalo"
BUFFALO PUMPS, INC.
159 MORTIMER STREET BUFFALO, N. Y
Subsidiary of Buffalo Forge Company
Canada Pumps, Ltd., Kitchener, Ont. Sales Representatives in all Principal Cities

A BETTER CENTRIFUGAL PUMP FOR EVERY LIQUID

HERMANN *Improved* CLAFLIN

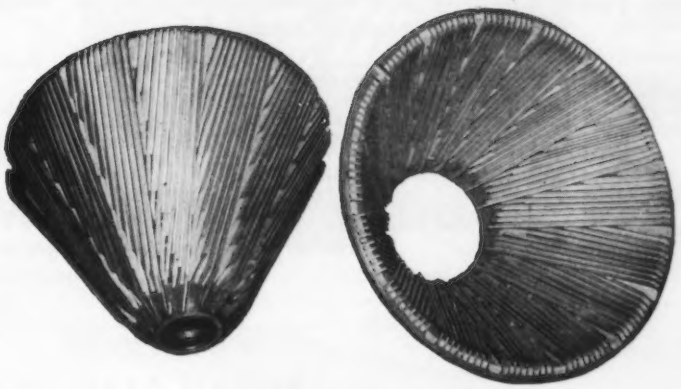
Fabricated in One-Piece-Liners quickly and easily changed.

•

One down time generally for removing wood when used.

•

Worn liners can be returned for a substantial credit, tagged and shipped freight collect.



Stainless Steel and Iron.

•

Heat Treated Chro-Manganese Steel.

•

Bar Widths: 3/16", 1/4", 3/8, 1/2" & 3/4".

•

With and without wood fillets for channel control.

FABRICATED TYPE CLAFLIN FILLINGS

ALSO: SPECIAL SECTIONAL TYPE HYDRATING SHELL—1/2" A. I. PLUG

"THE MOST VERSATILE REFINER AVAILABLE TODAY"

Exclusive Sales Agent: THE EMERSON MFG. CO., LAWRENCE, MASS.

THE HERMANN MFG. CO., LANCASTER, OHIO

Murco PLATE-SHELL TYPE BARKING DRUM

★ LOWER MAINTENANCE

★ LESS POWER

★ CLEANER WOOD

★ LESS BROOMING

Heavy duty, rugged design, high-grade workmanship throughout, MURCO smooth interior barking drum provided with sprays, when specified, delivers cleaner wood, because the smooth interior minimizes bruising and brooming. True barking action comes from the friction of log against log in a rubbing action. Barking is not due to a rough interior that only brooms the ends of the pieces . . . Completely designed as heavy duty equipment. You can depend upon MURCO Plate-Shell type barking drum to operate efficiently with a low maintenance cost, plus the fact that it delivers cleaner wood which means cleaner paper.

MADE IN 6 SIZES
10' by 30'
10' by 40'
12' by 30'
12' by 45'
15' by 45'
15' by 60'

MURCO ADAMS-CLARK *Portable* BARKER

The first machine of its type to prove successful in removing bark from pulpwood right at the logging site . . . carefully designed, thoroughly engineered and ruggedly built . . . proving successful in debarking Poplar, Spruce, Balsam, Hemlock, Cedar, and Tamarack ranging from 3 inches to 15 inches in diameter . . . furnished either truck, tractor or skid-mounted . . . will debark all types of wood—straight or reasonably crooked . . . readily maneuverable on logging sites . . . easily loaded . . . discharges barked wood by gravity to conveyor or ground as desired. Consult us for quotations, recommendations, etc. for adapting MURCO Adams-Clark Portable Barker to your pulpwood operations.

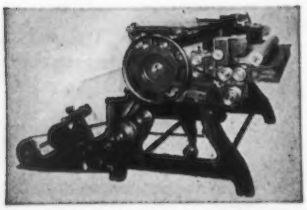
MADE IN 8 SIZES TO HANDLE VARIOUS WOOD LENGTHS

D. J. MURRAY MANUFACTURING CO. MANUFACTURERS SINCE 1883 WAUSAU • WISCONSIN

STANDARD & FACIAL TISSUE ROLL CONVERTERS

WITH OR WITHOUT

Latest Improvements: Parent Roll Drive with Automatic Tensioning — Velvet Smooth, Quick Accelerating Clutch



Slitters and Rewinders for Vulcanized Fibre and Heavy Board

•

Towel Interfolders for single interfold

•

Special Machinery

Rotary Card Cutters

•

Spiral Tube Machines for Toilet Roll Cores

•

Designing

DIETZ MACHINE WORKS

Factory-Office: 126 W. Fontaine St.

SINCE 1901 **PHILADELPHIA 22, PA., U. S. A.**

WILLIAMS-GRAY CO.

221 North La Salle Street
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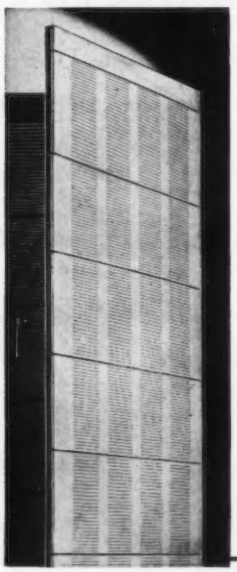
Paul Foster
Barney Benson
Peter Talbot
Ross Lawrence
Herb. Fishburn

Lindsay & Niagara Wires
Knox "Excelsior" Felts
Siamese & Richland Dryer Felts
Carrier Rope
Splicing Tissues
Deckle Webbing
Etc.

MAGNUS-MADE

FABRICATED SCREEN PLATES

for High Plate Capacity—Long Plate Life



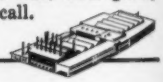
"Hardy" fabricated screen plates, made by Magnus of chrome-nickel-steel or inconel, have a high-strength, thin sheet design that's specially engineered for *maximum flow*. About 40,000 of these plates are now in service, with performance records that prove these three important advantages:

1. **Increased Plate Capacity.** The thin sheet eliminates relief milling, and with recommended arrangement, substantially increases capacity per plate.

2. **Longer Life.** Slots remain sharp, side walls highly polished for the life of the plate. There's greatly improved corrosion resistance, too.

3. **High, Sustained Yield.** Fabricated screen plates assure consistent, uniform quantities of cleaner pulp. This means improved production at reduced operating costs.

Complete information is yours on request. Or if you like, we'll gladly have an engineer call.



MAGNUS METAL CORPORATION, *Fitchburg, Mass.*
Metalworkers for the Paper Trade

SCREEN PLATES: BRONZE, CHROME-NICKEL-STEEL, AND INCONEL
VALVES: GATE, SWING CHECK, BLOW, GLOBE, ANGLE AND "Y"

Supplying Your Requirements

AMERICA'S LEADING INDEPENDENT WASTE PAPER PACKERS

WASHINGTON, D. C.
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THOMAS PAPER STOCK COMPANY
1500 No. Hooker Street • Chicago 22, Ill.

The New
BROUGHTON

White Water
Head Box Shower

Adjustable to all types of headboxes, completely covers surface, killing foam and keeping sides of headbox clean. Reverse flow selfcleaning. ¼ turn of valve lever cleans the nozzles.

A. E. BROUGHTON & COMPANY

Glens Falls
New York

MID-WEST REPRESENTATIVE: Ronningen Engineering Sales, Vicksburg, Michigan . . . *CANADA:* Davidge & Co., Limited, Montreal, Canada . . . *ENGLAND:* Vickerys Limited, 4 Lambeth Place Road, London S. E. 1, England . . . *FRANCE:* J. Achard-Picard, 17, Rue de l'Aqueduc, Paris, France . . . *SWEDEN:* Ingeniorsfirman Fliesberg Aktiebolag, Stockholm 7, Sweden.

Keep Your Super Calender Operation Wrinkle-Free!

Mount Hope FREE WHEELING EXPANDERS

Leading Paper Mills in the United States, Canada and Europe report: "Mount Hope Ball Bearing Free Wheeling Expanders improve paper machine operations to such an extent that no mill can afford to operate without them!"

Your own experience will prove that these devices can eliminate waste, increase operating speed, improve quality obtained from your paper machines, calenders, coating machines, slitters, rewinds, etc.

Write for Bulletin EPX — or a Mount Hope Engineer to call. No obligation!

Mount Hope Expander installation at Nicolet Corp., (location), on 72" width super calender.

MOUNT HOPE MACHINERY COMPANY
15 FIFTH STREET • TAUNTON • MASSACHUSETTS

Williams High Speed Centrifuge

The Most Rapid Method for the Reduction of Stock to a Definite Moisture Content from which Moist Samples May be Taken for Accurate Freeness Tests. For the Determination of Consistency of Beater and Machine Stock, Fiber in White Water, etc.

Development and Manufacture of Pulp and Paper Testing Instruments for 25 years.

Pulp Testing Ovens
Sheet Moulds
Laboratory Presses
Sheet Dryers
Wood Chip Classifiers
Pebble Mills
A.S.T.M. Penetration Testers
Smoothness Testers
Paper Moisture Testers
Freeness Testers
Laminating and Plastic Moulding Presses

WILLIAMS APPARATUS CO., Inc.

19 PARK PLACE — WATERTOWN, N. Y.

WYANDOTTE CHEMICALS

Improved Bleach with Wyandotte Liquid Caustic—Wyandotte Liquid Caustic may benefit your bleach operations by reducing handling costs, lowering losses of chlorine, giving you cleaner finished paper with a minimum reversion of brightness. For complete information write our Technical Service Department.

Wyandotte CHEMICALS

Headquarters for Alkalies

Wyandotte Chemicals Corporation
Wyandotte, Michigan • Offices in Principal Cities.

WEST VIRGINIA PULP and PAPER COMPANY

230 Park Ave.
New York 17, N. Y.

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Manufacturers of West Virginia Mill Brand Papers

SUPERCALENDERED
ENGLISH FINISH
LITHOGRAPH
LABEL
OFFSET
EGGSHELL
MUSIC
POSTER
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WRITING
ENVELOPE
MIMEOGRAPH
INDEX BRISTOL
POST CARD
COVER
CUP AND CONTAINER
FILE FOLDER
COATED
MACHINE COATED

KRAFT LINER BOARD
KRAFT CONVERTING AND KRAFT ENVELOPE

MILLS

Mechanicville, New York
Luke, Maryland
Covington, Virginia
Tyrone, Pennsylvania
Williamsburg, Pennsylvania
Charleston, South Carolina

EXCELSIOR KNOX Woolen Co. Camden Me. FELTS & JACKETS

"EXCELSIOR" FELTS

The Trademark of Felts of Superior Quality for Every Grade of Pulp and Paper

KNOX WOOLEN COMPANY

CAMDEN, MAINE

Look to the Source!

WHEN YOU USE SODIUM CHLORATE FROM OLDBURY . . . you may rely upon the reputation of your source of supply as absolute assurance of the product *quality* and *uniformity* that you must have to maintain and advance your own product standards and customer services.

OLDBURY
ELECTRO-CHEMICAL COMPANY
Plant and Main Office:
NIAGARA FALLS, NEW YORK
New York Office:
19 RECTOR STREET, NEW YORK 6, N.Y.

EVERY STEP A SAFE STEP WITH BLAW-KNOX GRATING

Everyone walks safely, confidently on Blaw-Knox Electroforged Steel Grating . . . the one-piece panels stay rigid and strong—without shimmy or shake—because there are no parts to work loose. Twisted cross bars provide sure footing under the most adverse conditions. For complete information, write for Bulletin 2365.

BLAW-KNOX GRATING
Industry's first choice for
• SAFETY • STRENGTH • LONG LIFE
• LOW UPKEEP • SELF-CLEANING

Grating Department
BLAW-KNOX DIVISION of Blaw-Knox Co.
2055 Farmers Bank Bldg.,
Pittsburgh 22, Pa.

BLAW-KNOX ELECTROFORGED STEEL GRATING

SAVE METAL AND MONEY With This Steel Pipe

Both design and maintenance engineers find that Armco Steel Pipe helps them save time, metal and money.

Job requirements can be matched exactly because Armco Pipe is available in a wide range of diameters (6 to 36 inches) and wall thicknesses (¼- to ½-inch). You buy no excess metal, conserve steel.

Long lengths, up to 50 feet, reduce assembly time, speed installation. And either special or standard fittings come welded to straight runs to fit your layout. You save a pair of flanges at every bend. With Armco Pipe there are fewer joints—less chance for leaks.

Try Armco Steel Pipe on that next job and see for yourself how it saves time, metal and money. Write for complete data. Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 1772 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. Export: The Armco International Corporation.

ARMCO STEEL PIPE ARMCO

Paper Trade Journal CLEARING HOUSE

HELP WANTED

MEN WANTED—POSITIONS OPEN

We can place—Supts. and asst. supts. paper converting plants; technical directors, salary range $8,000-$12,000 year; mill managers and supts. (several); purchasing agent; exec. controller paper con. plant, salary range $10,000-$12,000 year.

Chemists, chem. engineers and laboratory men for mills also for demonstrating and selling; color chemist coating mill; salesmen to sell paper, also chemicals and other products to paper and pulp mills and paper converting plants; accountant-office mgr.

Plant engineers and asst. plant engineers; power plant supervisors; mechanical engineers, designers and draftsmen; machine tenders and back tenders; Cylinder and Fourdrinier machine foremen for United States and foreign countries, salaries up to $150 wk.

Engineers and draftsmen for electrical, instrument, mechanical, structural, operating, process, piping and project engineering and checkers, top salaries and transportation paid.

LIST YOUR CONFIDENTIAL APPLICATION WITH US to keep informed of attractive positions open in the pulp and paper mills.

CHARLES P. RAYMOND SERVICE, INC.
294 Washington St., Boston 8, Mass.
Telephone LIberty 2-6547
SPECIALISTS IN PLACING AND IN SUPPLYING PULP AND PAPER MILL EXECUTIVES
S-19

SALES MANAGER

To take charge of marketing nationally advertised outstanding paper wrap chemically treated with patented volatile corrosion inhibitor that prevents rust. Exclusive Non-Rust product. Fabricated into bags, envelopes an special forms. Unlimited opportunity for sales in metal working, hardware, and metal specialty fields where protection against rust is important. Prefer man in 30's with good sales background and knowledge of industrial packaging field. Permanent connection and good future for right man. Write full details to:

Nox-Rust Chemical Corporation
2429 South Halsted Street
Chicago 8, Illinois
S-19

PLANT ENGINEER

To coordinate activities of design engineering firm and contractors during construction. Direct all engineering and maintenance in completed mill. Should have not less than ten years experience in pulp and paper mill maintenance. Experience in maintenance of sulphate pulp production facilities necessary. Familiarity with groundwood and newsprint production desirable. Summarize experience. Box 52-274, Paper Trade Journal. TF

HELP WANTED

GRADUATE CHEMICAL or MECHANICAL ENGINEER FOR production engineering position on supervisory staff of paper board mill located in Indiana. Mill is unit of one of leading and nationally recognized paper board, carton and container manufacturing concerns. Unusual opportunity for aggressive young man to learn production and control methods. Advancement should be rapid, depending only upon the ability of the man to assume responsibility. Inherent supervisory ability important. Prefer man recently graduated from recognized engineering college. Please give details of background in first letter. Address Box 52-406 care Paper Trade Journal. S-26

MANAGER WANTED

To take full charge of a new division to manufacture paper frozen food cartons and other sanitary food packages. This is an attractive position with a strongly established company in the paper field.

Applicant should be thoroughly experienced in operation of converting equipment and handling of men.

Telephone or write in confidence to

CHARLES P. RAYMOND SERVICE, Inc.
294 Washington St., Boston 8, Mass.
Telephone LIberty 2-6547 S-26

WANTED — EXPERIENCED GUMMING SUPERINTENDENT OR PLANT MANAGER

The man we seek must be experienced in gumming, slitting and packing operations, either as a foreman, a superintendent or assistant superintendent, but for reasons of his own, may be seeking a change. This position is with one of the older, well established, gummed tape manufacturers. Their product is already well known in the field. That this top position is open, is known to the personnel of our own organization. The position is to be permanent, with top salary, and a contract, if desired.

Please give complete details of years of experience in each position, education and age in first letter. (All replies held in the strictest of confidence).

Address Box 52-405 care Paper Trade Journal. O-3

HELP WANTED

SALES ENGINEER

Sales and Service representative to live in Pacific Northwest and call on pulp and paper industry. Prefer graduate mechanical or chemical engineer. Age 30-40. Reply to Personnel Director, Oliver United Filters, Inc., 2900 Glascock Street, Oakland, Calif. O-10

Assistant Supt., paper; Assistant Supt., paperboard, M. E. pref.; Assistant Manager, converting; Chemists, research, coating (plastic) Mechanical Engineers, for eng. dept. and maintenance, paper mill exp.; maintenance man, paper fin. mchy.; Mech. Engrs. no exper. required; Finishing supt.; Supt. for fine paper mill; Salesmen for paper, paperboard, stationery, respectively. Several Tour Bosses, M.T. and B.T. as well as Beater Engrs.
Many other positions open
Personnel Service Assoc., 115 State St.,
Springfield 3, Mass. S-19

CHEMIST

We have an opening for a graduate chemist preferably with technical and operating experience. New England mill rag grades. We want a young man who can eventually become our General Superintendent. In reply please summarize training and experience. Box 52-396, Paper Trade Journal. S-26

HELP WANTED

Starting our second machine. Need Machine Tenders, Back Tenders, Third Hands, and Beater Engineers. One straight Fourdrinier and One Yankee Fourdrinier. Manufacturing Wrappings, Specialties, Corrugating Medium, and Light Weight Chip. Best of Labor Relations, Insurance, and Liberal Pension Plan. Mill Located about 40 miles from Chicago, Ill.

PRAIRIE STATE PAPER MILLS
JOLIET, ILLINOIS PHONE 3-3441 OR WRITE
TF

GENERAL ACCOUNTANT

Under general direction of comptroller, to supervise general accounting dept., maintain general ledger, develop financial statements, prepare all tax returns, and handle operating budgets. Should have college degree plus at least five years of accounting experience in paper industry. In reply summarize training and experience. Address—Bowaters Southern Paper Corporation, Calhoun, McMinn County, Tennessee. TF

CIVIL ENGINEER

Recent graduate or experienced. Permanent position with progressive concern in north Florida. Salary commensurate with ability. Write Box 52-394, care Paper Trade Journal. O-3

RATES FOR CLEARING HOUSE ADVERTISING

HELP WANTED—75c a line. Minimum charge $3.75.

SITUATIONS WANTED—75c a line. Minimum charge $3.75. If repeated ½ rate will be charged for each consecutive repetition.

FOR SALE—75c a line. Minimum charge $3.75.

WANTED—75c a line. Minimum charge $3.75.

OPPORTUNITIES—75c a line. Minimum charge $3.75.

Classified advertising space may also be purchased at $5.00 per single column inch. All classified advertisements are payable in advance. If box number is used—70 cents additional

Address replies to advertisements appearing under Box Number in care of
PAPER TRADE JOURNAL, 15 West 47th Street, New York 19, N. Y.

HELP WANTED

SALARIED POSITIONS $3,500 to $35,000. We offer the original personal employment service (established 42 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars. R. W. BIXBY, INC. —117 Dun Bldg., Buffalo, 2, N. Y. S-19

WANTED—Experienced Cylinder Machine Tender and Cylinder Backtender. Summarize Experience. Address: Chemical Paper Mfg. Co., Jackson St., Holyoke, Mass. O-3

HELP WANTED

PAPER COATING CHEMIST for laboratory of Upper Midwest mfgr. of bleached and unbleached groundwood, sulphite, kraft pulp, printing and converting papers. Prefer chemist or chem. engr. grad. with 2-4 years applied research exp. in paper coating field. Reply, giving personal history, expr. and salary expected. Address Box 52-392 care Paper Trade Journal. S-26

RESEARCH MAN with paint or coating formulation expr. for laboratory of Upper Midwest insulation board mfgr. Prefer chemistry or chemical engr. grad. with 1-2 years expr. in paint or insulation board industry. Will consider recent chem. egnr. grad. Reply giving personal history, expr. and salary expected. Address Box 52-393 care Paper Trade Journal. S-26

HELP WANTED

RECENT Papermaking or Chemical Engineering Graduate with some technical experience in paper or paperboard desirable. Man selected will be responsible for product and process development work as a member of the technical staff in a progressive, integrated midwestern board mill. Excellent advancement opportunities exist. In replying, give complete background of education and experience along with salary requirements. Address Box 52-409 care Paper Trade Journal. S-19

WANTED—Young Industrial Engineer with experience in paper finishing to supervise department. Please state all particulars and salary requirement in first letter. Address Box 52-407 care Paper Trade Journal. S-26

FOR SALE

FOR SALE

FOR SALE

1 Sandusky Suction Press Roll, 120" drill face x 22" diameter, complete, with anti-friction bearings.
1 Sandusky Suction Couch Roll, 126" drilled face x 22" diameter.

FOR SALE

BARKING DRUM
1—10′ x 30′.

BEARINGS
72—Top and bottom Dryer Bearings 7" diameter.

BEATERS
1—Dilts Iron Tub Laboratory Beater. Beater roll 14" diameter x 10¾" face.

CALENDER STACKS
1—9 roll 56" Supercalender Stack.
1—9 roll 68" Calender Stack.
1—4 roll 72" Calender Stack. (Extra heavy duty).
1—3 roll 60" Friction Calender Stack. Two iron rolls and 1 Paper or Cotton Roll.
1—12 roll 116" Calender Stack.
1—9 roll 84" Supercalender Stack.

CHEST
1—Cast Iron Stock Chest, 25′ long x 6′ high. (With agitator).

CHIPPERS
1—96" Murray 4 knife Chipper—anti-friction bearings.
1—84" Carthage 4 knife Chipper.

CLASSIFINER
1—Dilts Classifiner, practically new, with motor.

CRUSHER & HAMMERMILL
1—Murray Chip Crusher.
4—Jeffrey Hammermill.
1—#6 Mitts & Merrill Hog.

CYLINDER MOLDS
2—30" diameter x 72" face.
2—36" diameter x 54" face.
4—36" diameter x 84" face.
1—48" diameter x 72" face.
1—30" diameter x 92" face.
1—42" diameter x 120" face.
4—42" diameter x 130" face.
1—48" diameter x 117" face.
2—36" diameter x 110" face.

DIGESTERS
2—14′ Globe Rotary Digesters.

DRIVES
1—Jones Reducer 75 h.p.—30.8 to 1.
1—#6½ Reeves Drive.
1—#4 Reeves Drive
1—Reliance Electric Drive, complete with 5 gear head motors.

DRYERS
1—Complete unit, consisting of 6 dryers, 36" diameter x 38" face, including frames, gears, anti-friction bearings.
7—24" diameter x 48" face.
1—36" diameter x 143" face.
1—48" diameter x 70" face.
2—Dryers 48" diameter x 134" face.
1—24" diameter x 92½" face.
2—28" diameter x 48" face.
1—36" diameter x 67" face.
1—84" diameter x 48" face.
3—48" diameter x 88" face, with bearings and gears.
1—36" diameter x 90" face.
2—36" diameter x 120" face.
9—36" diameter x 76" face.
1—48" diameter x 144" face.
5—28" diameter x 77" face.

FLAT SCREENS
1—6 plate Shartle Flat Screen.
2—12 plate Flat Screens.

FOURDRINIER PARTS FOR 134" MACHINE
6—Suction Boxes, 23 table rolls. Brass Slide Rails.

GEARS
30 gears, for 36" diameter Dryers, 108 teeth 3¼" face.

GRINDERS
2—4 pocket Grinders.
2—3 pocket Grinders.

GUILLOTINE CUTTER
1—60" Cutter.

JORDANS
2—#1 Jones High Speed Jordans, with 75 h.p. motors, new 1948.
4—Noble & Wood Mammoth.
1—#4 Hercules.
1—#2 Emerson anti friction bearing.
1—#1 Emerson.

LIME SLUDGE FILTERS
2—IMPCO Lime Sludge Filters, vacuum type, 5′ diameter x 4′ face.

MOTORS
2—150 h.p., 440 r.p.m., with starting equipment.
Write us regarding your requirements.

PRESSES
3—Sets Primary Presses, complete, 145" face. Anti-friction bearings. Also all types of rolls for 145" wet end.

PULLEYS
Various cone and assorted pulleys.

PULPERS
1—Jones Pulper. Complete with motor and drive.
1—Noble & Wood Pulper—Iron Tub.
1—Lannoye Pulper.

PUMPS
1—Gould Triplex Hydraulic Pump, 2 x 6, 1750# pressure.
Various sizes of Centrifugal and Plunger Pumps. Write us regarding your particular requirements.
3—Shartle Brothers circulating pumps, each 4,000 g.p.m.
1—Frederick, 8 x 12, with motor.
1—Shartle, 8 x 14, 2000 g.p.m., 62′ head, direct connected to circulating pump, with motor.

REELS
1—123"—3 bowl Revolving Reel.
1—72" Dowingtown Reel, 2 bowl.

REFINERS
1—134"—2 drum.
2—#1 Claflin Refiners.

ROLLS
3—Rubber Cover Press Rolls, 76" face x 18½" diameter. Plastometer 25.
Felt, Table, Press, Breast, Couch, etc. Various sizes and types. (Bronze, Rubber, Iron, etc.)

ROTARY SCREENS
2—#2 Bird—Copper vats—complete.
1—#2A Bird—Copper vats—complete.

SAVEALLS
1—#5 Bird Saveall.
1—Oliver Vacuum Filter (Saveall 8′ x 14′ mold).
2—Savealls, 36" diameter x 136" face cylinder molds, iron end vats.
1—Pusey & Jones 42" x 146" Saveall.

SHAKER ROLLS
1—134" face x 14" diameter with Messenger bearings.
1—104" face x 14" diameter with Messenger bearings.

SHEETERS
1—48" Hamblet Sheeter.
1—122" Horne Sheeter.
1—60" Hamblet Sheeter.

SHREDDERS
2—Daniels Rag Cutters.

SLITTERS & WINDERS
1—120" 4 drum Moore & White.
1—115" 2 drum Waldron
1—104" Beloit two drum winder.
1—92" Moore & White 4 drum winder.
1—72" Cameron—Type 8-10.
1—72" Cameron—Type 10.
1—45" Knowlton Slitter.
1—52" Cameron—Type 6.
1—42" Cameron Type 40-1-AF
3—42" Cameron—Type 6
1—42" Cameron Constant Tension with pneumatic control.
1—84" Langston Slitter.
1—108′ Sandy Hill Winder.
2—84"—4 drum Moore & White.
1—62" Cameron—Type 10.

STEAM JOINTS
30—Beloit Steam Joints.

STOCK PUMPS
1—10 x 20 Shartle Duplex.
1—7 x 16 Shartle Duplex.
2—10 x 10 Beloit Duplex, low type.
Advise as to your requirements.

SUCTION BOXES
5—136" face Suction Boxes.
6—140" face.

SUCTION PRESS ROLLS
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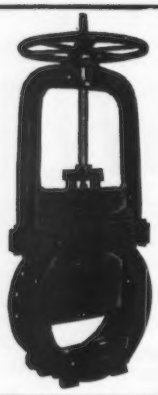

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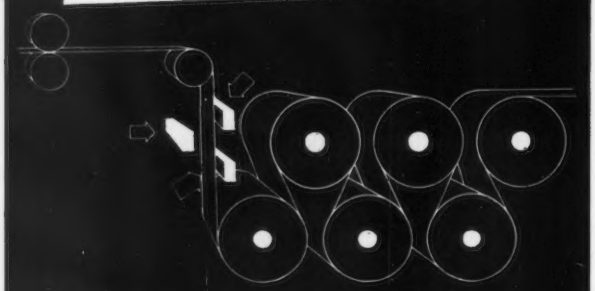

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The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DEINKING CHEMICALS
E. I. du Pont de Nemours & Co., Inc.
General Dyestuff Corp.
Kinsley Chemical Co.
Nopco Chemical Co.

DE-MINERALIZING EQUIPMENT
Hungerford & Terry, Inc.

DEMULSIFIERS
Wyandotte Chemicals Corp., Michigan Alkali Div.

DENSOMETERS
W. & L. E. Gurley

DESIGN CONSTRUCTION
Ebasco Services

DETERGENTS
Amalgamated Chemical Corp.
American Cyanamid Company Industrial Chemicals Division
Calgon, Inc.
Diamond Alkali Co.
General Dyestuff Corp.
Monsanto Chemical Company
Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

DEWAXING CHEMICALS
American Cyanamid Company Industrial Chemicals Division
General Dyestuff Corp.
Nopco Chemical Co.

DIFFERENTIAL SCALES
Thwing-Albert Instrument Co.

DIGESTERS
Babcock & Wilcox Co.
Biggs Boiler Works Co.
Blaw Knox Company
Chicago Bridge & Iron Co.
Combustion Engineering-Superheater, Inc.
Lukenweld
Pandia, Inc.
Paper & Industrial Appliances
Pusey & Jones Corp.

DISPERSING AGENTS
Calgon, Inc.
Diamond Alkali Co.
General Dyestuff Corp.
Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

DOCTORS
The Bagley & Sewall Company
Bird Machine Company
Black Clawson Company
Downingtown Mfg. Co.
Lobdell United Co.
Lodding Engineering Corp.
The Moore & White Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DOCTOR BLADES
The Bagley & Sewall Company
Bird Machine Company
Lodding Engrg. Corp.
The Moore & White Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Simonds Saw & Steel Co.
Westinghouse Electric Corp.

DRIERS
The Bagley & Sewall Company
Beloit Iron Works
Biggs Boiler Works Co.
Black Clawson Company
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Lukenweld
The Moore & White Co.
Murray Mfg. Co., D. J.
J. J. Ross Company
Red-Ray Mfg. Co., Inc.
Rice Barton Corporation
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

DRIERS—LABORATORY
The Noble & Wood Machine Co.

DRILLED SUCTION COUCH ROLLS
Manchester Machine Co.

DRILLED SUCTION DRUM ROLLS
Manchester Machine Co.

DRIVES
Appleton Machine Co.
The Bagley & Sewall Company
Beloit Iron Works
Bird Machine Co.
Black Clawson Company
Dodge Mfg. Corp.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Jeffrey Mfg. Co.
General Electric Company
Gibbs-Brower Company, Inc.
Manchester Machine Co.
Moore & White Co.
Murray, D. J., Mfg. Co.
Pusey & Jones Corp.
Rice Barton Corporation
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Bros. Mch. Co.
Valley Iron Works Co.

DRUM WINDERS
Manchester Machine Co.
Rice Barton Corporation

DRYER ROLL PYROMETER
Midwest Fulton Mch. Co.
Thwing-Albert Instrument Co.

DUSTERS
Appleton Machine Co.
Downingtown Mfg. Co.
Frank W. Egan & Co.
M. W. Jenkins Sons, Inc.
E. D. Jones & Son Co.
Moore & White Co.
D. J. Murray Mfg. Co
John Waldron Corp.

DUSTING BRUSHES
M. W. Jenkins Sons, Inc.

DYESTUFFS
American Cyanamid Company Calco Chemical Div.
Ciba Company

PAPER MILL CORES

Made to SPECIFICATIONS

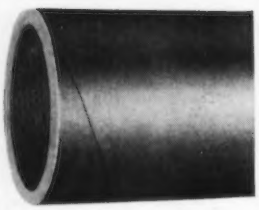
by SONOCO

MAKERS OF

Precision Paper Products

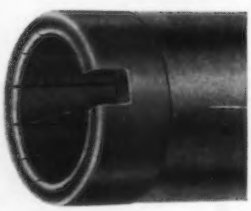
RHINO
NON-RETURNABLE

RHINO—an all purpose core for one time use that we have perfected into an extremely durable, tough, *non-returnable* paper mill core. Superior crushing strength. Made to all standard specifications of size and thickness.



DURO
RETURNABLE

DURO—a *returnable* paper mill core that more than meets the standard specifications. DURO cores are made standard 3⅛" I. D. equipped with SONOCO heavy duty open or closed notched metal ends to fit 3" shaft. SONOCO light duty metal ends, which protect inside of the core only, can be specified.



THE SONOCO HEAVY-DUTY METAL ENDS FOR RETURNABLE CORES

Made to take abuse. Notch strongly reinforced by heavy steel patch welded in place, which also gives adequate bearing surface on the notched portion of the core. Longitudinal ribs actually gear metal end to the core, making for a unified and exceptionally strong carrier for repeated use.

sonoco
PAPER CARRIERS
REG. U.S. PAT. OFF.

SONOCO PRODUCTS COMPANY

BRANTFORD ONT. | HARTSVILLE S. C. | MYSTIC CONN.

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Geigy Co., The
National Aniline Division, Allied Chemical & Dye Corp.

ELECTRIC HYGROMETER
Thwing-Albert Instrument Co.

ELECTRICAL PRECIPITATORS
Research Corporation

EMBOSSING MACHINES
Dilts Machine Works
Egan, Frank W., & Co.
John Waldron Corp.

EMBOSSING ROLLS
The Appleton Machine Co.
Gibbs-Brower Company, Inc.
Holyoke Machine Co.
B. F. Perkins & Son, Inc.
John Waldron Corp.
Wheeler Roll Co.

EMPLOYMENT SERVICE
Bixby, R. W., Inc.
Raymond, Chas. P., Service, Inc.

EMULSIFIERS
General Dyestuff Corp.
Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp.

ENZYMES
Rohm & Haas Co.
Vanderbilt Co., R. T.

EVAPORATORS
Biggs Boiler Works Co.
Goslin-Birmingham Mfg. Co., Inc.
Murray, D. J., Mfg. Co.
Swenson Evaporator Co., Div. of Whiting Corp.
Westinghouse Electric Corp.

EXPANDERS
Mount Hope Machinery Co.

FANS
General Electric Co.
B. F. Perkins & Son, Inc.
Ross Engineering Co., J. O.
Westinghouse Electric Corp.

FEEDERS
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Merrick Scale Mfg. Co
The Permutit Company

FELTS
Appleton Woolen Mills
Asten-Hill Mfg. Co.
Draper Bros. Corp.
Huyck & Son, F. C.
Lockport Felt Co.
Morey Paper Mill Supply Co.
Orr Felt & Blanket Co.
Shuler & Benninghofen
Waterbury Felt Co.
Waterbury, H., & Sons Co.
Williams-Gray Co.

FELT CLEANERS
Calgon, Inc.
General Dyestuff Corp.
Nopco Chemical Co.

FELT CONDITIONERS
Bird Machine Co.
The Noble & Wood Machine Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works

FELT GUIDES
Black Clawson Company
Frank W. Egan & Co.
Gilbert & Nash Co.
Moore & White Co.
The Noble & Wood Machine Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

FIBRE BOARD MACHINES
The Noble & Wood Machine Co.

FILLERS
American Cyanamid Company, Industrial Chemicals Division
J. M. Huber Corp.
A. M. Meincke & Son, Inc.
Vanderbilt Co., R. T.
Wyandotte Chemicals Corp., Michigan Alkali Div.

FILTERS
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Holyoke Machine Co.
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Improved Paper Machinery Corp.
Johnson Corp.
Moore & White Co.
J. O. Ross Engrg. Corp.
The Sandy Hill Iron & Brass Works
Walworth Company

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Crane Company
Grinnell Company
Shartle Bros. Mch. Co.
Walworth Company

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Egan, Frank W., & Co.
Jeffrey Mfg. Co.
John Waldron Corp.
Westinghouse Electric Corp.

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Norton Co.

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Lukens Steel Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works

FORK LIFT TRUCKS
Elwell Parker Elec. Co.
Towmotor Corp.

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Williams Apparatus Co., Inc.

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Manchester Machine Co.
The Moore & White Co.
Noble & Wood Machine Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

FREENESS TESTERS
Testing Machines, Inc.
Williams Apparatus Co.

GASKETS
B. F. Goodrich Co.
The Goodyear Tire & Rubber Company

GEAR REDUCERS
Dodge Mfg. Corp.

GEARS
The Bagley & Sewall Company
Black Clawson Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Frank W. Egan & Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Westinghouse Electric Corp.
Western Gear Works

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GRAVITY FILTERS
Holyoke Machine Co.

GRINDERS
Carthage Machine Co.
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Lobdell United Co.
Norton Company
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Works

GRINDING WHEELS
Norton Company
Simonds Abrasive Co.

GUIDES
The Bagley & Sewall Company
Beloit Iron Works
Black-Clawson Co.
Egan, Frank W., & Co.
Gilbert & Nash Co.
The Moore & White Co.
Mount Hope Machinery Co.
Rice Barton Corporation
John Waldron Corp.

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Dilts Machine Works
Egan, Frank W., & Co.
The Sandy Hill Iron & Brass Works
Waldron, John, Corp.

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Hercules Powder Co., Inc.
National Starch Products, Inc.

HEAT EXCHANGERS AND RECOVERY SYSTEMS
Westinghouse Electric Corp.

HEATING, VENTILATING & AIR CONDITIONING
The Appleton Machine Co.
E. D. Jones & Sons Co.
General Electric Co.
D. J. Murray Mfg. Co.
Red-Ray Mfg. Co., Inc.
Ross Engineering Corp., J. O. Ross, Jr. Engrg. Corp.
Valley Iron Works Co.
Westinghouse Electric Corp.

HOISTS
Reading Crane & Hoist Corp.

HOSE (Air, Water, Suction, etc.)
B. F. Goodrich Co.
The Goodyear Tire & Rubber Company

HUMECTANTS
Aktivin Division, Heyden Chemical Corp.
Nopco Chemical Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

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American Cyanamid Company, Industrial Chemicals Division
B. F. Goodrich Chemical Co.

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Dilts Machine Works

INDUSTRIAL TIRES
B. F. Goodrich Co.

INDUSTRIAL TRACTORS
Towmotor Corp.

INKOMETER
Thwing-Albert Instrument Co.

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Cambridge Instrument Co.
General Electric Company
W. & L. E. Gurley
B. F. Perkins & Son
Taylor Instrument Cos.
Testing Machines, Inc.
Thwing-Albert Instrument Co.
Tracerlab, Inc.
A. van der Korput
Williams Apparatus Co.
Westinghouse Electric Corp.

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Beloit Iron Works
Cram Associates
Johnson Corp.
Rice Barton Corporation
Shartle Bros. Mch. Co.

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E. D. Jones & Sons Co.
The Noble & Wood Machine Co.
Shartle Bros. Mch. Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

KILNS
F. L. Smidth

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Black Clawson Company
Bolton & Sons, Inc.
Dilts Machine Works, Inc.
Dusenbery Co., Inc.
Hamblet Machine Co.
E. D. Jones & Sons Co.
The Moore & White Co.
The Noble & Wood Machine Co.
Simonds Saw & Steel Co.
Taylor Stiles & Co.
Valley Iron Works Co.

KNOTTERS
Black-Clawson Co.
Improved Paper Machinery Corp.

LABORATORY CORRUGATOR
The Noble & Wood Machine Co.
Thwing-Albert Instrument Co.

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Appleton Machine Co.
Bauer Brothers Co.
Biggs Boiler Works Co.
Bird Machine Company
Dilts Machine Works
W. & L. E. Gurley
Egan, Frank W., & Co.
Hermann Mfg. Co.
E. D. Jones & Sons Co.
Taylor Instrument Companies
Testing Machines, Inc.
Valley Iron Works Co.
John Waldron Corp.
Williams Apparatus Co., Inc.

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The Bagley & Sewall Company
Dilts Machine Works
Egan, Frank W., & Co.
Rice Barton Corporation
John Waldron Corp.

LAY BOYS
Dilts Machine Works
Gibbs-Brower Company, Inc.
Hamblet Machine Co.
Moore & White Co.

LINTER COTTON
Hercules Powder Co., Inc.
Railway Supply & Mfg. Co.

LINTER PULP
Hercules Powder Co., Inc.

LUBRICANTS
Sinclair Refining Co.
Socony-Vacuum Oil Co.
Sun Oil Company
The Texas Company
Tide Water Associated Oil Co.

MAGAZINE REELS
Dilts Machine Works (Kohler Systems)

MATERIALS HANDLING
Dilts Machine Works
Jeffrey Mfg. Co.
Shartle Bros. Mch. Co.
The Wellman Engrg. Co.

MICROMETERS & CALIPERS
Farrel-Birmingham Co.
Lobdell Co.
Testing Machines, Inc.

MIXERS
Bailey & Co., Inc.
Mixing Equipment Co.

MICRO-CRYSTALLINE WAXES
Bareco Oil Co.
Sun Oil Company

MOISTURE CONTENT CONTROL
Cambridge Instrument Co.
Williams Apparatus Co., Inc.

MOISTURE METERS
Hart-Moisture-Meters

MOTORS
Elliott Company

MOTORS AND GENERATORS
Fairbanks, Morse & Co.
General Electric Company
Reliance Electric & Engrg. Co.
Westinghouse Electric Corp.

NICKEL AND NICKEL ALLOYS
The International Nickel Co.

NOZZLES
Spray Engrg. Co.

PACKING BOXES
Johnson Corporation
The Moore & White Co.
Shartle Brothers Machine Co.

PAPER MACHINE DRIVES
The Bagley & Sewall Company
Beloit Iron Works
Black-Clawson Co.
Manchester Machine Co.
Rice Barton Corporation
Westinghouse Electric Corp.

PAPER MACHINES
The Bagley & Sewall Company
Beloit Iron Works
Bagley & Sewall Co.
Black Clawson Company
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Lukenweld
Manchester Machine Co.
Moore & White Co.
Pusey & Jones Corp.
Rice Barton Corporation
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.

PAPER MACHINES—LABORATORY
The Noble & Wood Machine Co

PAPER MACHINE SLICES
Black Clawson Company
E. D. Jones & Sons Co.
The Moore & White Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.

PAPER TUBE MACHINERY
Dietz Machine Works
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Hudson Sharp Machine Co.
Jagenberg-Werke Akt. Ges.
Langston Co., Samuel M.

PARAFFINE WAXES
Sun Oil Company

PARAFFIN WAX EMULSIONS
American Cyanamid Co., Ind. Chem. Div.
Hercules Powder Co., Inc.
Nopco Chemical Co.

PASTING MACHINES
Beloit Iron Works
Black Clawson Company
Dilts Machine Wks.
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Murray, D. J., Mfg. Co.

For LOW COST

ROLL COATING

IMPREGNATING LAMINATING

Here's a new, economical coater built to insure dependable service and long life. Its design permits a wide variety of coating, impregnating and laminating operations. This Ecco coater will handle all types of film forming materials in dispersions, emulsions or solutions and it can be adapted to sheet or continuous web coating of paper, textiles, plastic films, foils, etc.

Among its many uses are:-

Coating paper, textiles, film, etc.

Applying laminating adhesives to paper, textiles, films, etc.

Impregnating paper and textiles

Applying heat sealing adhesives and many similar operations

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Write For Bulletin 1000—with diagrams showing the variety of operations for which the low cost Ecco coater can be used, along with construction details, prices, etc.

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Portland — Seattle — San Francisco

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Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

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F. L. Smidth & Co.

pH METERS
Cambridge Instrument Co.
Thwing-Albert Instrument Co.

PIPE
Armco Drainage & Metal Products, Inc.
Babcock & Wilcox Co.
Biggs Boiler Works Co.
Crane Company
Grinnell Company
Michigan Steel Casting Co.
National Tube Co.
Walworth Company

PIPE FITTINGS
Armco Drainage & Metal Products, Inc.
Crane Company
Grinnell Company
Michigan Steel Casting Co.
Walworth Co.

PITCH CONTROL
American Cyanamid Company, Industrial Chemicals Division
General Dyestuff Corp.
Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Rohm & Haas Co.

PLASTICIZERS
American Cyanamid Company, Industrial Chemicals Division
Aktivin Division, Heyden Chemical Corp.
B. F. Goodrich Chemical Co.
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Rohm & Haas Co.

PLATERS
Gibbs-Brower Company, Inc.
Perkins & Son, Inc., B. F.

PLATES
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Babcock & Wilcox Co.
Lukenweld Division
Lukens Steel Company
J. O. Ross Engrg. Corp.
Timken Roller Bearing Co.

PLUGS
The Appleton Machine Co.
Black Clawson Company
E. D. Jones & Sons Co.
The Noble & Wood Machine Co.
Shartle Brothers Machine Co.

POPE TYPE REELS
Black-Clawson Co.
Egan, Frank W., & Co.
Manchester Machine Co.
Rice Barton Corporation

PRECISION SAMPLE CUTTER
Testing Machines, Inc.
Thwing-Albert Instrument Co.

PRESERVATIVES
E. I. du Pont de Nemours & Co.
General Dyestuff Corp.

PRESS ROLLS
Beloit Iron Works
Black-Clawson Co.
Goodrich, B. F., Company, Inc.
Manchester Machine Co.
Rice Barton Corporation

PRESSURE FILTERS
Holyoke Machine Co.

PRESSURE VESSELS
Biggs Boiler Works Co.
Chicago Bridge & Iron Co.
Combustion Engineering-Superheater, Inc.

PRESSES
Beloit Iron Works
Black Clawson Company
Dietz Machine Works
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Hudson-Sharp Mch. Co.
Manchester Machine Co.
The Moore & White Co.
Potdevin Machine Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.
Waldron Corp., John
H. G. Weber & Co., Inc.
Williams Apparatus Co.

PULLEYS
Black-Clawson Co.
Dodge Mfg. Corp.
Rice Barton Corporation

PULP CLASSIFIER
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Thwing-Albert Instrument Co.

PULP CLEANERS
Bird Machine Co.
Nichols Engrg. & Research Corp.

PULP STOCK VALVES
Crane Company
Grinnell Company
Record Fdy. & Mach. Co.
Rice Barton Research Corp.
Shartle Brothers Machine Co.

PULPERS
Apmew, Inc.
Bauer Brothers Co.
Cowles Company
Dilts Machine Works
E. D. Jones & Sons Co.
Midwest Fulton Mch. Co.
Morden Machines Co.
The Noble & Wood Machine Co.
Rice Barton Research Corp.
Shartle Brothers Machine Co.

PULPS
Brown Company
Bulkley, Dunton Pulp Co., Inc.
Gottesman & Co., Inc.
Lyddon & Co. (America), Inc.
Nordicus, Inc.
Parsons & Whittemore, Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.
Pulp Sales Corp.
Restigouche Co., Ltd.

PULP SCREENS
Bird Machine Co.
Trimbey Machine Works

PULPSTONES
Norton Company

PULP TESTERS
Williams Apparatus Co., Inc.

PULVERIZING MILLS
Combustion Engineering-Superheater, Inc.
Jeffrey Mfg. Co.
F. L. Smith & Co.

PUMPS
Apmew, Inc.
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Buffalo Pumps, Inc.
Byron Jackson Co.
DeLaval Steam Turbine Co.
Downingtown Mfg. Co.
Fairbanks, Morse & Co.
Gibbs-Brower Company, Inc.
Johnson Corp.
Moore & White Co.
The Noble & Wood Machine Co.
Nash Engineering Co.
Roots Connersville Blower Corp.
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Warren Steam Pump Co.

RADIANT BURNERS
Red-Ray Mfg. Co., Inc.

RAG COOKING PROCESSES
The Kinsley Chemical Company
General Dyestuff Corp.
Rohm & Haas Co.

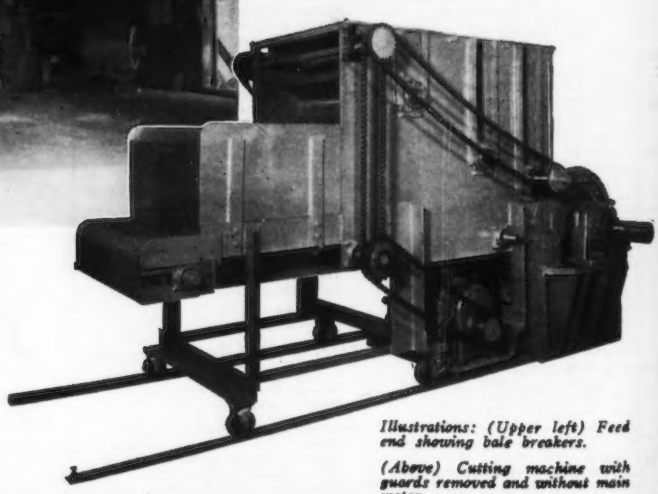
RAG CUTTERS
Gibbs-Brower Company, Inc.
B. F. Perkins & Son, Inc.
Taylor-Stiles & Co.

RECOVERY SYSTEMS
Babcock & Wilcox Co.
Chicago Bridge & Iron Co.
Combustion Engineering-Superheater, Inc.
Moore & White Co.
D. J. Murray Mfg. Co.
Pusey & Jones Corp.
Ross Engineering Corp., J. O.
Valley Iron Works Co.

REELS
The Appleton Machine Co.
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Dilts Machine Works (Kohler Systems)
Egan, Frank W., & Co.
Downingtown Mfg. Co.
Hudson-Sharp Mch. Co.
Manchester Machine Co.

A NEW COMBINATION BALE OPENER AND STRAW CUTTER

This new machine is part of the development program sponsored by the U. S. Government and by the paper manufacturers to improve the processing of straw for incorporation in strawboard and other papers.



- It opens the bales.
- Cuts the straw to short lengths.
- Shortens the time in the digesters.
- Improves the product.
- Permits the use of straw in papers where never possible before.
- Cuts up to 1000 pounds of straw per minute.

For full particulars write or wire—

TAYLOR, STILES & CO.

10 Bridge Street **Riegelsville, N. J.**

Illustrations: (Upper left) Feed end showing bale breakers.

(Above) Cutting machine with guards removed and without main motor.

Moore & White Co.
Rice Barton Corporation
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.
Waldron, John, Corp.

REFINERS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
Bauer Brothers Co.
Dilts Machine Works
Gibbs-Brower Company, Inc.
Hermann Mfg. Co.
E. D. Jones & Sons Co.
Morden Machines Co.
Murray, D. J., Mfg. Co.
The Noble & Wood Machine Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sprout Waldron & Co., Inc.
Sutherland Refiner Corp.
Valley Iron Works

REGULATORS
Apmew, Inc.
Bird Machine Company
General Electric Co.
Improved Paper Machinery Corp.
Johnson Corp.
Meyer Governor Co.
Shartle Brothers Machine Co.
Taylor Instrument Companies
Trimbey Machine Works
Westinghouse Electric Corp.

RESINS
American Cyanamid Company, Plastics & Resins Division
The Dow Chemical Company
B. F. Goodrich Chemical Co.
The Goodyear Tire & Rubber Company
Hercules Powder Co.
Monsanto Chemical Company
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Pittsburgh Division, Libbey-Owens-Ford Glass Co.
Reichhold Chemicals, Inc.
Rohm & Haas Co., Resinous Products Div.

ROLLS
Appleton Machine Co.
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Frank W. Egan & Co.
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
B. F. Goodrich Co.
Holyoke Machine Co.
Lindsay Wire Weaving Co.
Lobdell United Co.
Manchester Machine Co.
The Moore & White Co.
D. J. Murray Mfg. Co.
The Noble & Wood Machine Co.
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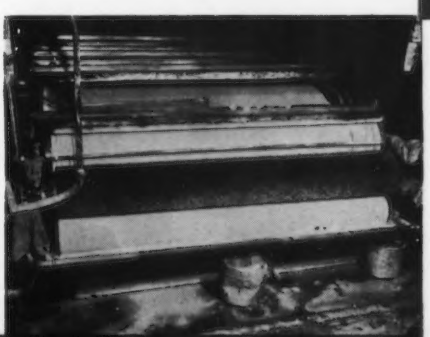

Paper coating machine with splash guard removed to show Jenkins' METLKOR cylinder brush in operating position. Mounted above are three sets of Jenkins' LIFEWOOD flat brushes. Photo courtesy of Michigan Paper Company, Plainwell, Mich

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